

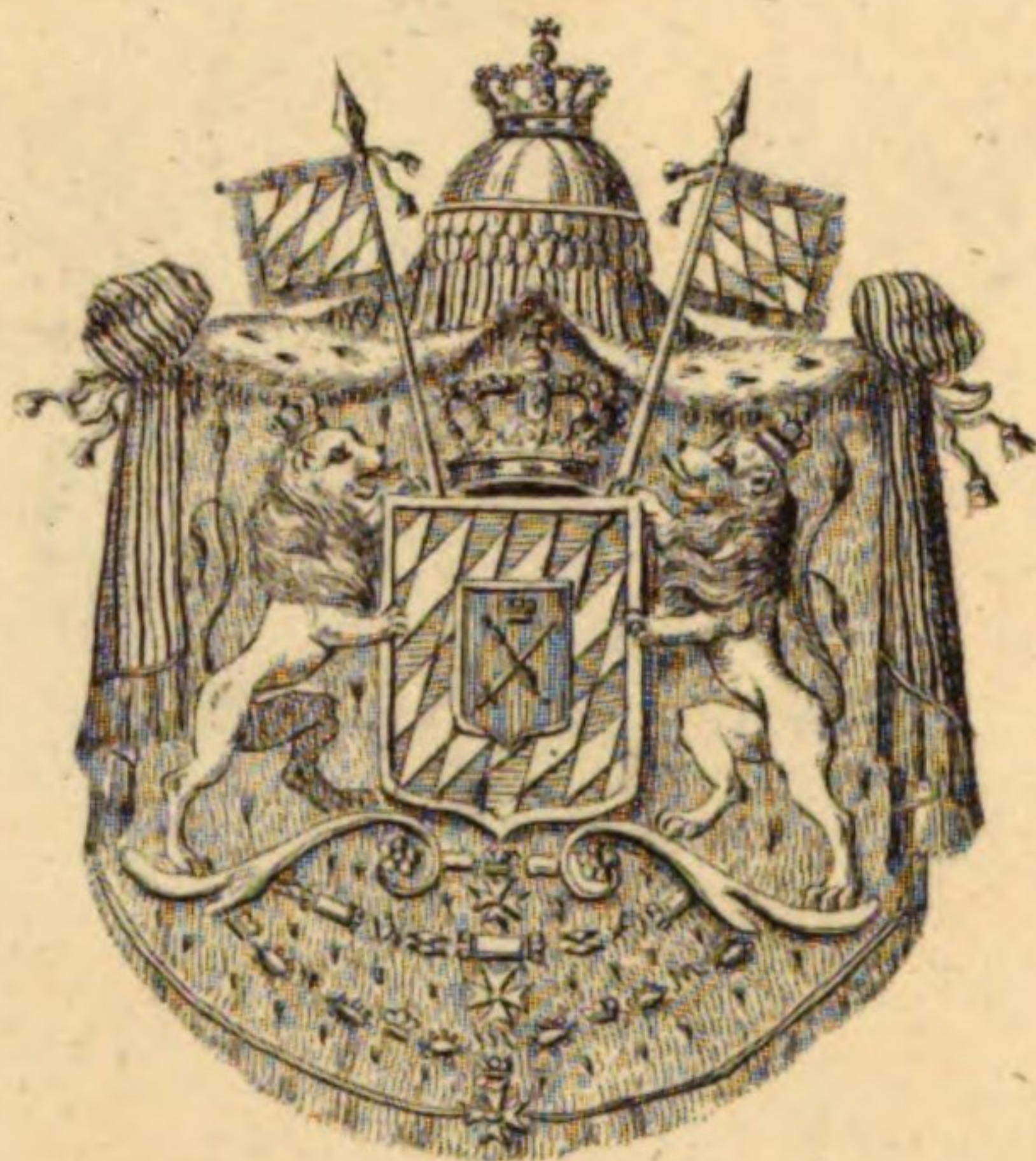
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AMERICAN

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AMERICAN

MEDICAL BOTANY.

VOLUME II.—PART I.

AMERICAN
MEDICAL BOTANY.

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M. med. 121 $\frac{m}{3}$

AMERICAN
MEDICAL BOTANY

BEING A COLLECTION

OF THE

NATIVE MEDICINAL PLANTS

OF THE

UNITED STATES

CONTAINING THEIR

BOTANICAL HISTORY AND CHEMICAL ANALYSIS

AND PROPERTIES AND USES

MEDICAL BOTANY

MEDICINE, DIET AND THE ARTS

VOL. II — PART I

WITH

COLORRED ENGRAVINGS

BY JACOB BICKNELL, M. D.

LECTURE, PROFESSOR OF BOTANY IN THE MEDICAL DEPARTMENT OF HARVARD UNIVERSITY

VOL. II

BOSTON:

PUBLISHED BY LITTLE, BROWN AND COMPANY, AT THE

BOSTON BOOKSTORE, NO. 7 CORNHILL

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IN

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WITH

COLOURED ENGRAVINGS.

=

BY JACOB BIGELOW, M. D.

RUMFORD PROFESSOR AND LECTURER ON MATERIA MEDICA AND BOTANY
IN HARVARD UNIVERSITY.

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VOL. II.

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BOSTON:

**PUBLISHED BY CUMMINGS AND HILLIARD, AT THE
BOSTON BOOKSTORE, NO. 1 CORNHILL.**

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AMERICAN
MEDICAL BOTANY
ADVERTISEMENT
BEING A COLLECTION

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DISTRICT OF MASSACHUSETTS, TO WIT:

District Clerk's Office.

BE it remembered, that on the twenty eighth day of October, A. D. 1818, and in the forty third year of the Independence of the United States of America, Jacob Bigelow, M. D. of the said district, has deposited in this office the title of a book, the right whereof he claims as author, in the words following, viz.

"American Medical Botany, being a collection of the native medicinal plants of the United States, containing their botanical history and chemical analysis, and properties and uses in medicine, diet and the arts, with coloured engravings. By Jacob Bigelow, M. D. Rumford Professor and Lecturer on Materia Medica and Botany in Harvard University. Vol. II."

In conformity to the Act of the Congress of the United States, entitled "An Act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned:" and also to an act entitled, "An act supplementary to an act entitled, an act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies during the times therein mentioned; and extending the benefits thereof to the arts of designing, engraving and etching historical and other prints.

JOHN W. DAVIS, } Clerk of the District
of Massachusetts.

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UPON presenting to the public the portion of this work, which completes one half of his labours, the author of the American Medical Botany feels himself bound to offer some report of the progress and prospects of his undertaking.

The plan of this work was formed and announced at a time when such a subject was wholly novel, and when coloured botanical engravings, from the difficulty and expense of their execution, were almost unknown in this country. It was endeavoured that the plan should be such as in some degree to insure, what both authors and their friends should desire, extensive circulation and permanent utility. An edition of a thousand copies was printed, and that the work might be generally accessible, the price was fixed at a lower rate, in proportion to the number of plates, than works of the kind have ever been placed at in this country; a rate which the probable sale of the whole edition could alone justify. As permanent utility was esteemed of more importance than ephemeral success, the work has not been hurried in any stage of its execution, even though some temporary advantages might have been obtained by its earlier appearance. The author has not willingly adopted the opinions of others in botany or medicine without examination, and has thought no delay injurious which might lead to the establishment of truth or the detection of error. He has been desirous, in adding the results of his own experience, that the book should have, in some degree at

least, the character of an original work, rather than of a compilation; at the same time that it should present a fair view of what is known on the subjects of which it treats. The figures of the plants have, in every instance, been made from original drawings, which were executed by himself, with the exception of two or three presented by his friends. The style of engraving is wholly new in this country, and is one which has been successfully attempted only by the first artists in France.

It gives him pleasure to state, that the reception of the work, in all parts of the United States, has exceeded his anticipations, that the subscription is already more than sufficient to defray the expense of publishing, and that its regular increase renders it probable that the whole edition will be taken up at an early period.

He avails himself of this occasion to return his acknowledgments to those correspondents who have obligingly assisted him by the communication of specimens for the work, and of the results of their own researches and experience. Particularly he would express this remembrance to ZACCHEUS COLLINS Esq. of Philadelphia, a gentleman whose active kindness has repeatedly supplied his botanical necessities; and whose extensive erudition has enabled him to afford counsel, which would not have been sought at a less respectable source. To Professor IVES of New Haven, a zealous and intelligent cultivator of the American *Materia Medica*, he would express the obligations derived from his communications and correspondence. It would be unjust to forget that many medicinal plants of the Southern States, with observations on their properties, were furnished expressly for this work, by the late Dr. JAMES MACBRIDE of Charleston, S. C. a

ADVERTISEMENT.

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physician and a botanist, whose premature death has terminated a career of honourable usefulness and of active, liberal and efficient prosecution of science. His friends cannot remember without regret a man, who had the rare quality of being learned without ostentation, who was ambitious of usefulness more than of fame, and who sought rather to be valuable to others than just to himself.

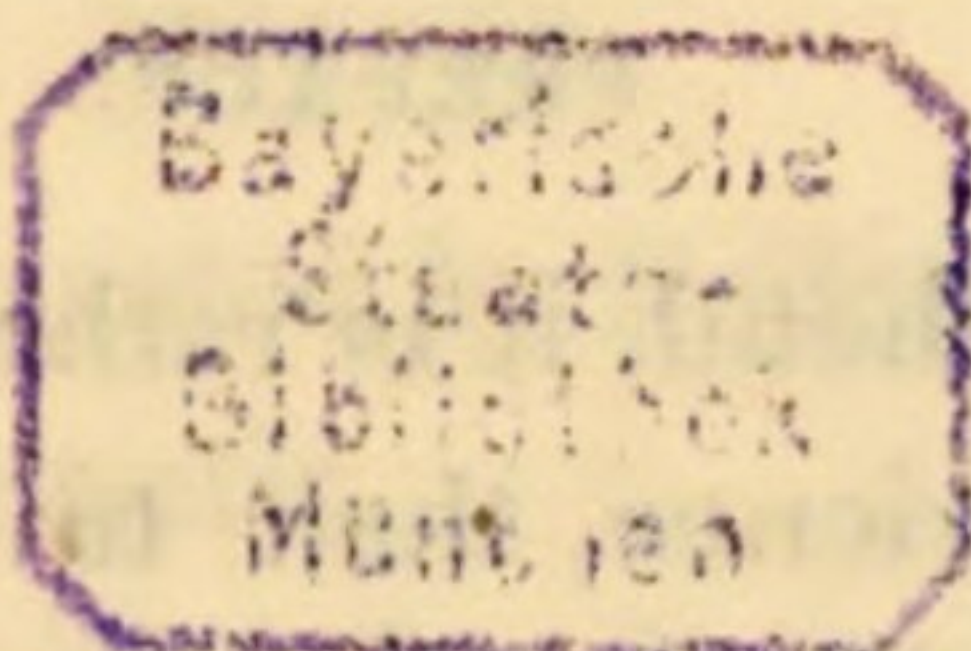
As the materials for the rest of the American Medical Botany are now principally collected, and most of the drawings finished; the remaining numbers will be issued with as much promptness and regularity, as is consistent with their faithful execution.

As frequent use is made in these pages of observations drawn from the auxiliary sciences, as affording some light on the medicinal properties of plants, it may be proper to examine how far the testimony of this kind is entitled to receive credit in our inquiries and examinations.

There can be no question, that the actual operation of medicines upon the human system, gathered from positive experience, is, in the present state of our knowledge, the only criterion by which we can pronounce, with universal certainty, on their properties. There are nevertheless many things to be learnt from chemical analysis, sensible qualities, and botanical affinity, which may afford us, in some instances certainly, and in most others presumptive evidence of the medicinal characters of vegetables. The correspondence in these respects is frequently so striking, that we can hardly resist the belief, that an entire harmony of properties exists, which, if we are unable

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fully to comprehend, it is rather owing to the imperfection of science, than to the irregularity of nature.

A few illustrations of this point, taken from general facts already ascertained, will place the subject in a clearer light.

The chemical substances, known by the names of *Gum Mucus* and *Fæcula*, are constantly emollient, demulcent, and nutritious. They manifest these qualities even when extracted from acrid and poisonous vegetables, as in *Arum*, *Calla*, and *Jatropha*.

Sugar is nutritious and demulcent. When subjected to a spontaneous chemical change by the vinous fermentation, it is universally a strong diffusible stimulus.

Fixed oils are emollient and laxative. Also nutritious.

Volatile oils on the contrary are acrid, stimulating, heating, and antispasmodic.

Tannin and the *Gallic acid* are uniformly antiseptic and powerfully astringent.

The *Acetous*, *Citric*, *Tartaric* and similar vegetable *acids* are refrigerant and antiseptic.

Bitter Extractive substances are usually tonic.

Resins, which are bitter and acrid, are commonly cathartic.

Emetine, as separated by Pelletier and Magendie, is powerfully emetic.

Morphium, obtained by Serturner, is a very strong narcotic.

The foregoing are some of the examples, which the present state of Chemistry allows us to observe of affinity between chemical and medicinal characters. With a few exceptions they will be found to be strictly true. Yet the analysis of vegetables is at present but imperfectly known, and an extended investigation is continually bringing new principles to light. We can hardly expect that the business of generalization should be attempted with complete success, until the constituent facts are better understood. From what we already know, however, it is not chimerical to predict, that if the chemistry of vegetables were as perfectly known in all its parts, as in those which we have detailed; their medicinal properties might be inferred, with at least as great certainty, as that which now attends most inferences in the conjectural science of medicine.

In regard to the botanical affinities of plants, as affording evidence of their medicinal powers, much has been said and written. Petiver, Hoffman, Linnæus, Hasselquist, and recently the learned Professor Decandolle have bestowed much

investigation on this subject. It is regarded as a desideratum by all, and as the consummation of botanical science by many, that plants should be so arranged, as that their assemblages should agree, not only in external forms, but in internal qualities and operative powers. Certain general agreements of this kind evidently prevail throughout nature ; yet they are so varied, and subject to so many exceptions, that it is difficult to establish them by general scientific descriptions, and when they are rendered too minute they seem to lose much of their importance. It is perhaps as easy to know the properties of plants from their external habit, as to understand the characters of mankind from their physiognomy. Accurate observers know more than they can communicate the means of knowing to others, yet the most accurate are liable to be mistaken. Many vegetables of the closest affinity and resemblance, even species of the same genus, differ wholly from each other in their effects. Witness the species of *Cucumis*, *Convolvulus*, and *Solanum*, some of which are salutary, and others highly deleterious. Nevertheless there are many general truths, or at least general probabilities, by which every one would be influenced, and which have so much importance, that they will never be forgotten.

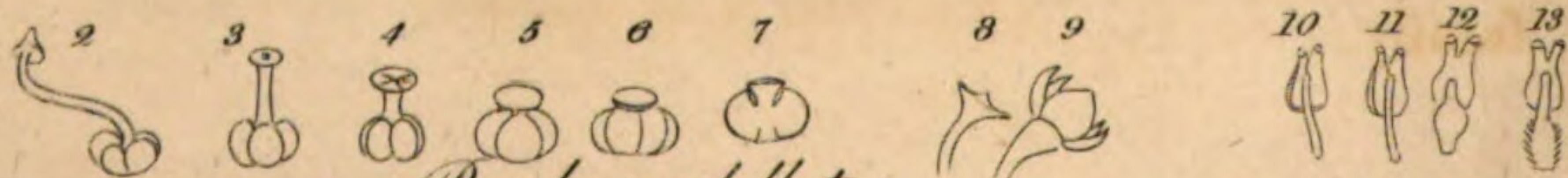
No botanist, even if in danger of starving in a wilderness, would indulge his hunger on a root or fruit taken from an unknown plant of the natural order *Luridæ*, of the *Multisiliquæ*, or the *umbelliferous aquatics*. On the contrary, he would not feel a moment's hesitation in regard to any of the *Gramina*, the fruit of the *Pomaceæ*, and several other natural families of plants, which are known to be uniformly innocent in their effects.

The *sensible properties* of plants afford another clue to their influence on the human system. It is true, that observations derived from this source will not serve us in forming very minute distinctions. They are, however, almost always adequate in vegetable productions, to enable us to distinguish what is innocent and salubrious, from what is noxious and virulent. The brute creation depend wholly upon the powers of sense in selecting their food, and this reliance does not often betray them. In regard to mankind it almost uniformly happens, that what is sweet, delicious, or aromatic, proves nutritive or salutary; while on the other hand, vegetable poisons are nauseous, acrid, and disgusting. It has been observed, that it would have been a sort of treachery in nature to have made it otherwise. Considering the universal dissemination of poisonous plants, and the

number of them, which frequent the vicinity of human habitations, this^t arrangement of Providence, by making ungrateful what is dangerous, has furnished almost the only safeguard from harm, to the inexperienced and unwary.

These remarks have been offered on account of an impression which many persons entertain, that collateral evidences of the characters of plants are worthless and undeserving of attention. Even if the community were composed exclusively of physicians, such an opinion could not be wholly correct. Every one may be called on to form hasty decisions on subjects where his experience is deficient, and where an acquaintance with auxiliary facts might lead him to a correct issue. It is not only curious and instructive to perceive the harmonies of nature, but to every inquirer among her works it must be practically useful. It can no where be more useful, or more deserving of study, than in a new country, where the face of nature presents an ungathered harvest, and where every clue to useful discovery derives importance from its influence and tendency.

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from its influence and tendency. It is not
with the world that we are to be acquainted, but
as nature is the source of all our knowledge, it is
in the study of nature that we are to find the
key to the mysteries of the universe.



Pyrola umbellata

AMERICAN
MEDICAL BOTANY.

BY DR. J. C. WATSON.

PHILADELPHIA.

1843.

The most beautiful of the species of *Coryla* is *C. americana*, diffused throughout the northern hemisphere. It inhabits all latitudes in the United States, and extends across the continent to the Atlantic Ocean. It is also found in the mountains of Europe, and in several of the northern islands of the North Atlantic. It only grows in a sterile soil, and is protected from frost by a covering of leaves and wood. The common appellations, by which it is known in the United States, are *White-bark* and *Pipit*. It flowers in June and July, and is one of the most of the other species of its genus.



Tyrola umbellata



AMERICAN
MEDICAL BOTANY.

PYROLA UMBELLATA.

Winter Green.

PLATE XXI.

THIS most beautiful of the species of *Pyrola* is extensively diffused throughout the northern hemisphere. It inhabits all latitudes in the United States, and extends across the continent to the shores of the Pacific ocean. It is also found in the forests of Siberia, and in several of the northern and temperate countries of Europe. It only grows in shady woods, where it is protected from the sun, and nourished by the peculiar soil formed from the decomposition of leaves and wood. The most common appellations, by which it is known in the United States, are *Winter green* and *Pipsissewa*. It flowers in June and July, being somewhat later than most of the other species of its family.

By Pursh and some other American botanists, this species and one other have been separated from the genus *Pyrola*, to constitute a new family by the name of *Chimaphila*. As the grounds of distinction, however, between them are not sufficient to render it certain that this genus will ultimately stand; I have preferred retaining the original Linnæan name.*

* It is somewhat remarkable, that the genus *Chimaphila* was first established upon characters, which hardly exist in either of the plants it is intended to comprehend. The principal grounds of distinction, suggested by Michaux and adopted by Pursh, seem to consist in a *sessile stigma*, and anthers opening by a *subbivalve foramen*. Now the stigma is not sessile, since that term implies the absence of a style, and the anthers do not open by any subbivalve foramen, differing from the rest, but by two tubular pores, precisely as in the other species of *Pyrola*. Mr. Nuttall, in his interesting work on North American genera, has amended the character of *Chimaphila*, by bringing into view the calyx, filaments, &c. while he has added to the characteristics of *Pyrola*, a downy connexion of the valves of the capsule. In the calyx, however, the two species of *Chimaphila* are at different extremes from each other; one of them having a five leaved calyx, the leaves overlaying each other at base; the other having a five toothed calyx only, while the remaining species of *Pyrola*, being five parted, come between them. I have not been able to find the *tomentum* spoken of by Mr. Nuttall, in all the spiked species, and particularly in *P. secunda*.

If the genus *Pyrola* were ever to be dismembered, it should be into at least four distinct genera, as follows;

1. *Style declined, stigma annulate.*

P. rotundifolia, *P. asarifolia*, &c.

The genus *Pyrola* belongs to the class *Decandria*, and order *Monogynia*. It ranks among

2. *Style straight, stigma peltate.*

P. secunda, *P. uniflora*, &c.

3. *Style incrassated, calyx five leaved.*

P. maculata.

4. *Style immersed, calyx five toothed.*

P. umbellata.

If we go farther and take into view the direction and form of the filaments, and the other parts of flower and fruit, with their various combinations; we shall have nearly as many genera as there are now species, since it is well known that many of the most important specific distinctions in this genus are taken from the fructification.

On these accounts there can be no doubt that the genus *Pyrola* had better remain entire. In habit it is certainly one of the most natural genera we possess. All the species are humble evergreens, growing in woods, with creeping roots, ascending stems, and nodding flowers. All of them have their leaves in irregular whorls, flower with reversed anthers, and retain their style until the fruit is ripe. In inflorescence, one is solitary, two somewhat corymbed, and the rest spiked. The leaves of *P. secunda*, *umbellata* and *maculata* are usually in two or more whorls; those of most others in one radical whorl or aggregate. One species is said to be leafless.

In the dissections accompanying the figure of *P. umbellata* I have endeavoured to represent the evident gradation of the style from the species in which it is longest, to that in which it is shortest. In the same plate are added some of the varieties of the calyx and stamens.

The following remark of Sir James Edward Smith, the learned president of the Linnæan society, is from Rees' Cyclopedia, *Art. PYROLA*. "We can by no means assent to the establishment of that able writer's (*Fursh's*) Genus *Chimaphila*, there being surely no diversity of habit to support it, nor any character but a difference in the length of the style; which the other species of *Pyrola* shew to afford admirable specific, but no generic distinctions.

the *Bicornes* of Linnæus and the *Ericæ* of Jus-sieu.

The generic character is as follows. *Calyx* mostly five parted ; petals five ; anthers inverted, opening by two tubular pores ; capsule five celled, five valved.

The species *umbellata* has its leaves wedge shaped and toothed, flowers somewhat umbelled, calyx five toothed, and style immersed.

Its more minute description is as follows :

Root woody, creeping, sending up stems at various distances. The stems are ascending, somewhat angular, and marked with the scars of the former leaves. The leaves grow in irregular whorls, of which there are from one to four. They are evergreen, coriaceous, on very short petioles, wedge shaped, subacute, serrate, smooth, shining, the lower surface somewhat paler. The flowers grow in a small corymb, on nodding peduncles, which are furnished with linear bractes about their middle. Calyx of five roundish subacute teeth or segments, much shorter than the corolla. Petals five, roundish, concave, spreading, cream coloured, with a tinge of purple at base. Stamens ten. Filaments sigmoid, the lower half fleshy, triangular, dilated, and slightly pubescent at the edges ; the upper half filiform. Anthers

two celled, each cell opening by a short, round, tubular orifice, which points downward in the bud, but upward in the flower. Pollen white. Germ roundish, depressed, furrowed, obscurely five lobed, with a funnel shaped cavity at top. Style straight, half as long as the germ, inversely conical, inserted in the cavity of the germ, and concealed by the stigma. Stigma large peltate, convex, moist, obscurely five rayed. Capsules erect, depressed, five celled, five valved, the partitions from the middle of the valves. Seeds linear, chaffy, very numerous and minute.

This plant, like the other species of *Pyrola*, is very difficult to cultivate, when transplanted from its native soil; although it thrives luxuriantly in the shade and rich mould of the forests where it originates.

The leaves of *Pyrola umbellata*, when chewed, communicate to the mouth a taste which partakes of both sweet and bitter. The stalk and roots possess the same taste, combined with a moderate degree of pungency. A Dissertation "*De Pyrola umbellata*," published at Gottingen, by Dr. Wolf, in 1817, contains an elaborate chemical examination of this plant. As the result of his trials, this author concludes, that 100 parts of *Pyrola umbellata* contain about 18 of a bitter extractive princi-

ple, 2.04 of resin, 1.38 of tannin, a slight portion of gum, and the rest of fibrina and earthy salts. The resin is adhesive, brownish, readily soluble in ether and alkalis, burning with flame and a resinous odour, and leaving a white cinder.

From my own trials the quantity of resin in this plant appears to be very small. A saturated tincture of a deep brown colour does not give a precipitate on the first addition of water. It is only after some time standing, and partly perhaps from the evaporation of the alcohol, that a turbidness begins to appear in the solution. It is probable that spirit is a better menstruum than water for the soluble portions of this plant, although the latter is capable of extracting the greater part of its virtue.

The *Pyrola umbellata*, though scarcely known as a medicine until within a few years past, has at the present day acquired a reputation of considerable extent in the treatment of various diseases. Its popular celebrity seems to have originated in its application to the treatment of fever and rheumatism ; but the attention of physicians has been chiefly drawn towards its use in other complaints. The instances in which this plant has received favourable testimonies on medical authority, of its successful use, both in America

and Europe, are principally the following. 1. As a palliative in strangury and nephritis. 2. As a diuretic in dropsy. 3. As an external stimulant, susceptible of useful application to various cases.

In the first of these cases, the *Pyrola* is entitled to attention and confidence. Some practitioners in this country have employed it with advantage in the same cases, in which the *Arbutus Uva ursi* is recommended*. Dr. Wolf, the German writer lately cited, has reported a number of cases of ischuria and dysuria, arising from various causes, in which the *Pyrola*, given in infusion, produced the most evident relief, and took precedence of a variety of remedies which had been tried. His method of administering it was to give a table spoonful of a strong infusion, with a little syrup, every hour. In all the cases he has detailed, small as the dose was, it gave relief in a very short time. In one case its effect was so distinctly marked, that the disease returned whenever the medicine was omitted and was removed on resuming its use. A tonic operation attended its other effects, so that the appetite was improved and digestion promoted during the period of its employment.

* See Dr. Mitchell's Inaugural Dissertation. Philadelphia, 1803.

The diuretic properties of the *Pyrola umbellata*, seem to have been fully illustrated by Dr. W. Somerville in a paper on this vegetable, published in the 5th volume of the London Medico-Chirurgical transactions. The facts presented by this physician afford satisfactory evidence of the power of this medicine to promote the renal excretion, and to afford relief to patients afflicted with dropsy in its various forms. The most distinguished case presented by him, is that of Sir James Craig, the British governour in Canada, who was labouring under a general dropsy, which in its progress had assumed the forms of hydrothorax, anasarca and ascites, and which was combined with different organic diseases, especially of the liver. After having tried with little or temporary success, almost every variety of diuretic and cathartic medicines, and submitted twice to the operation of tapping, the patient had recourse to a strong infusion of the *Pyrola*, in the quantity of a pint every twenty four hours. Although the case was altogether an unpromising one, yet the plant gave relief, not only in the first, but in the subsequent instances of its use. It increased the urinal discharge, and at the same time produced an augmentation of strength and an invigorated appetite.

Several other cases of dropsy are detailed in Dr. Somerville's paper, in which the *Pyrola* was administered by himself and by other practitioners with decided advantage. Dr. Satterly and Dr. Marcet are among those who have added their observations to the testimonies in its favour. Dr. Somerville found his patients to remark, that an agreeable sensation was perceived in the stomach soon after taking the *Pyrola*, and that this was followed in some instances by an extraordinary increase of appetite. He considers it as having in this respect a great advantage over other diuretics, none of which are agreeable to the stomach, and most of them very offensive to it. He further states, that no circumstance had occurred within his own experience or information, to forbid its use in any form, or to limit the dose.

Dr. Wolf has given one very satisfactory case of the utility of our plant in ascites. He also found it to alleviate altogether the ardor urinæ attendant on gonorrhea.

Such are the most important facts which to my knowledge have been published respecting the internal use of the *Pyrola umbellata*. I have administered this plant on various occasions, and attended to its mode of operation. In a number of dropsical cases, when first given, it made a dis-

tinct and evident impression on the disease, communicating an increased activity to the absorbents, followed by a great augmentation of the excretion from the kidneys. The benefit, however, with me has been in most instances temporary, and it was found better to omit the medicine for a time and to resume it afresh, than to continue it until the system had become insensible to its stimulus. After suspending it for a week or two, the same distinct operation took place on returning to its use, as had been manifested in the first instance. It proved in almost every instance, a very acceptable medicine to the patient, and was preferred both for its sensible qualities and its effects on the stomach, to other diuretics and alteratives which had been prescribed.

The Pyrola has been considerably employed as an external application in tumours and ulcers of various descriptions. It first acquired notice in consequence of some newspaper attestations of its efficacy in the cure of cancer. Those persons who know how seldom genuine cancers occur in comparison with reputed ones, will be more ready to allow it the character of curing ulcerous, than really cancerous affections. There are undoubtedly many ulcers, and those frequently of a malignant kind, which are benefitted by antiseptic

stimulants ; and to such the *Pyrola* may be useful. But of its efficacy in real cancer we require more evidence than is at present possessed, before we ascribe to it the power of controlling so formidable a malady.

Dr. Miller of Franklin informs me that he has used a decoction and cataplasm of this plant with apparent success in various chronic indurated swellings. It acts as a topical stimulant, and when long continued, not unfrequently vesicates. Tumours of long standing have in several instances disappeared under its use.

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PLATE XXI.

Fig. 1. *Pyrola umbellata*.

Fig. 2. Pistil of *Pyrola rotundifolia*.

Fig. 3. Pistil of *Pyrola secunda*.

Fig. 4. Pistil of *Pyrola uniflora*.

Fig. 5. Pistil of *Pyrola maculata*.

Fig. 6. Pistil of *Pyrola umbellata*.

Fig. 7. Section of the same, shewing the length of the style.

Fig. 8. Five toothed calyx of *P. umbellata*.

Fig. 9. Five leaved calyx and incrassated pedicel of *P. maculata*.

Fig. 10. Anther magnified of *P. secunda*.

Fig. 11. Ditto of *P. rotundifolia*.

Fig. 12. Stamen magnified of *P. umbellata*.

Fig. 13. Ditto of *P. maculata*.

- Fig. 1. Profile of *Lychnis viscaria*.
- Fig. 2. Section of the same, showing the position of the stem.
- Fig. 3. First lateral calyx of *Lychnis viscaria*.
- Fig. 4. First lateral calyx and internal part of *Lychnis viscaria*.



- Fig. 5. Detail of the same, showing the position of the stem.
- Fig. 6. First lateral calyx of *Lychnis viscaria*.
- Fig. 7. First lateral calyx and internal part of *Lychnis viscaria*.
- Fig. 8. First lateral calyx and internal part of *Lychnis viscaria*.



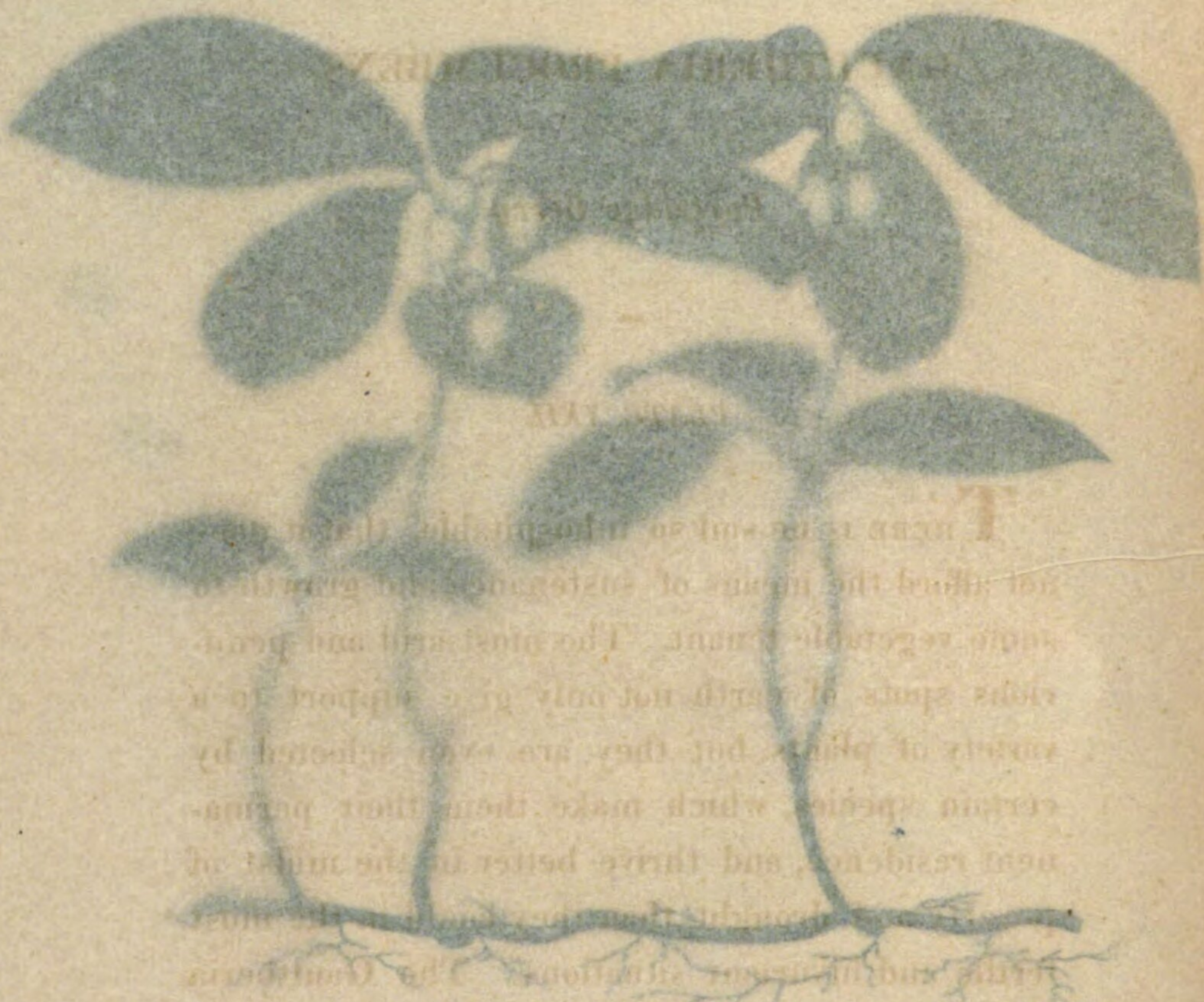
Gaultheria procumbens.

CAULOTUMMA FRANKLINIANA

Franklin's Tree

1842, 1843

This is one of the most beautiful of the trees
and shrubs of the mountains, and grows in
some of the most fertile soil. The plant is a small
round tree of about 10 to 15 feet high, and is a
variety of plants, but they are all collected by
certain species, which make up the mountain
forest, and which are very common in the
poverty and drought of the mountains. The
fertile and luxuriant situation. The *Caulotumma*
procumbens is one of these trees, and is a common
plant, which are better adapted to the dry air
of the mountains, than with a deep or shallow
soil. It is found growing in large beds under the
shade of shrubs and trees upon elevated tracts of
ground, or upon the sand and gravel of the driest
forests. Its bright evergreen leaves seem adapt-



The plant is one of the most common and useful of the vegetable kingdom. The root is thick and knobby, and bears several upright stems, which are clothed by a dense covering of large, ovate, dark green leaves. The flowers are small and round, and are borne at the ends of the stems. The plant is found growing in damp, shady places, and is used for medicinal purposes.

GAULTHERIA PROCUMBENS.

Partridge Berry.

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PLATE XXII.

THERE is no soil so inhospitable, that it does not afford the means of sustenance and growth to some vegetable tenant. The most arid and penurious spots of earth not only give support to a variety of plants, but they are even selected by certain species, which make them their permanent residence, and thrive better in the midst of poverty and drought than they could in the most fertile and luxuriant situations. The *Gaultheria procumbens* is one of those hardy and abstemious plants, which are better satisfied with the clear air of the mountains, than with a deep or mellow soil. It is found growing in large beds under the shade of shrubs and trees upon elevated tracts of ground, or upon the sand and gravel of the driest forests. Its bright evergreen leaves seem adapt-

ed for ready absorption and slow perspiration, so that it derives from the dews and rain, what the earth fails to supply it.

The *Gaultheria procumbens* is remarkable for the different periods of producing its flowers and fruit. It is found in blossom not only in the early part of spring, but in the last weeks of summer, and the fruit is found ripe at corresponding periods. Whether this appearance is the product of different shoots, or whether the same stems blossom twice in a year, I am unable to say. I have, however, met with beds of the *Gaultheria* in full flower in August and September, quite as frequently as in May. I have also seen the fruit in the market at various periods of the summer, fall, and spring.

The plant takes its vulgar names from the fruit, and is denominated in different parts of the United States, *Partridge berry*, *Chequer berry*, *Box berry*, &c. Its domestic use has also given it the name of *Mountain tea*.

The genus *Gaultheria* is beautifully singular and distinct in its character, derived from the form of its fruit. The *calyx* is *five cleft*, *calyculated*, or *bibracteate at base*. *Corolla ovate*. *Capsule five celled*, *invested with the baccated calyx*.

The species *procumbens* has a *prostrate stem* with ascending branches. Leaves in a terminal tuft, obovate with a few ciliate serratures. Flowers axillary.

Class *Decandria*, order *Monogynia*, Natural orders *Bicornes* Linn. *Ericæ* Juss.

The stem, or as it might be called root of this plant is horizontal, woody, often a quarter of an inch in thickness. The branches are ascending, but a few inches high, round and somewhat downy. Leaves scattered, near the extremities of the branches, evergreen, coriaceous, shining, oval or obovate, acute at both ends, revolute at the edge, and furnished with a few small serratures, each terminating in a bristle. Flowers axillary, drooping, on round downy stalks. Outer calyx of two concave, heart shaped leafets, which may with perhaps more propriety be called bractes. Inner calyx monophyllous, white, cleft into five roundish subacute segments. Corolla white, urceolate, five angled, contracted at the mouth, the border divided into five short, reflexed segments, Filaments white, hairy, bent in a semicircular manner to accommodate themselves to the cavity between the corolla and germ. Anthers oblong, orange coloured, ending in two double horns, bursting outwardly, for their whole length above the filaments,

and not opening by pores as in *Pyrola*. Pollen white. Germ roundish, depressed, five angled, resting on a reddish, ten toothed, glandular ring. Style erect, straight. Stigma simple, moist. The fruit is a small, five celled capsule, invested with the calyx, which becomes large, round, and fleshy, having the appearance of a bright scarlet berry.

If the aroma or odour and also the taste of plants were susceptible of description in as definite language as their proportions and form, the sensible qualities of many vegetables might afford new grounds for generalizing and combining them together. The aromatic flavour of the Partridge berry, which cannot easily be mistaken by those who have once tasted it, may be recognised in a variety of other plants, whose botanical habits are very dissimilar. It exists very exactly in some of the other species of the same genus, particularly in *Gaultheria hispidula*; also in *Spiræa ulmaria* and the root of *Spiræa lobata*. It is particularly distinct in the bark of the Sweet birch, *Betula lenta*, one of our most useful and interesting trees.

This taste and odour reside in a volatile oil, which is easily separated by distillation. The essential oil of *Gaultheria*, which is often kept in our druggists' shops, is of a pale or greenish white

colour and perfectly transparent. It is one of the heaviest of the volatile oils, and sinks rapidly in water if a sufficient quantity be added to overcome the repulsion of two heterogeneous fluids. Its taste is aromatic, sweet and highly pungent.

The oil appears to contain the chief medicinal virtue of the plant, since I know of no case in which the leaves, deprived of their aroma, have been employed for any purpose. They are nevertheless considerably astringent, and exhibit the usual evidences of this property when combined with preparations of iron.

The berries, or berry-like calyces, have a pulpy but rather dry consistence, and a strong flavour of the plant. They are esteemed by some persons, but are hardly palatable enough to be considered esculent. In the colder seasons they afford food to the partridges and some other wild animals.

The leaves, the essence and the oil of this plant are kept for use in the apothecaries' shops. An infusion of the leaves has been used to communicate an agreeable flavour to tea, also as a substitute for that article by people in the country. Some physicians have prescribed it medicinally as an emmenagogue, with success in cases attended with debility. The oil, though somewhat less pungent than those of peppermint and origanum, is

employed for the same purposes. It shares with them the property of diminishing the sensibility of the nerve exposed by a carious tooth, when repeatedly applied. The essence, consisting of the volatile oil dissolved in alcohol or proof spirit, is antispasmodic and diaphoretic, and may be applied in all cases where warm or cordial stimulants are indicated. A tincture, formed by digesting the leaves in spirit, possesses the astringency as well as warmth of the plant, and has been usefully employed in diarrhæa.

A respectable physician of Boston informs me, that he has in various instances found the infusion of this plant very effectual in promoting the mammary secretion, when deficient; and even in restoring that important function after it had been for some time suspended. Whether the medicine has any specific influence of this sort, independent of the general state of the patient's health, I am not prepared to say.

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PLATE XXII.

Fig. 1. *Gaultheria procumbens*.

Fig. 2. The bractes or outer calyx.

Fig. 3. The true calyx.

Fig. 4. Stamen of the natural size.

Fig. 5. Anther magnified, the dark places shewing the mode of opening.

Fig. 6. Calyx and pistil.

Fig. 7. Fruit.

Fig. 8. Longitudinal section of the fruit.

Fig. 9. Transverse section of the capsule.

PODOPHYLLUM PELTATUM.

May Apple.

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PLATE XXIII.

THE *Podophyllum peltatum* or *May apple*, otherwise called *Mandrake* in this country, inhabits low shady situations from New England to Georgia. On the Atlantic coast I have never met with it farther north than Boston, yet in the interior of the country it has a more extensive range. From its large creeping roots, it has a great tendency to multiply, and is always found in beds of greater or less extent. Its flowering time is from March to May.

This plant is one of the *Ranunculaceæ* of Jussieu and *Rhœades* of Linnæus ; and is in the first order of the Class *Polyandria*.

Its generic character consists in a *calyx* of three leaves ; from six to nine petals ; and a one-celled berry crowned with the stigma. Only one spe-



Podophyllum peltatum



Podophyllum peltatum.

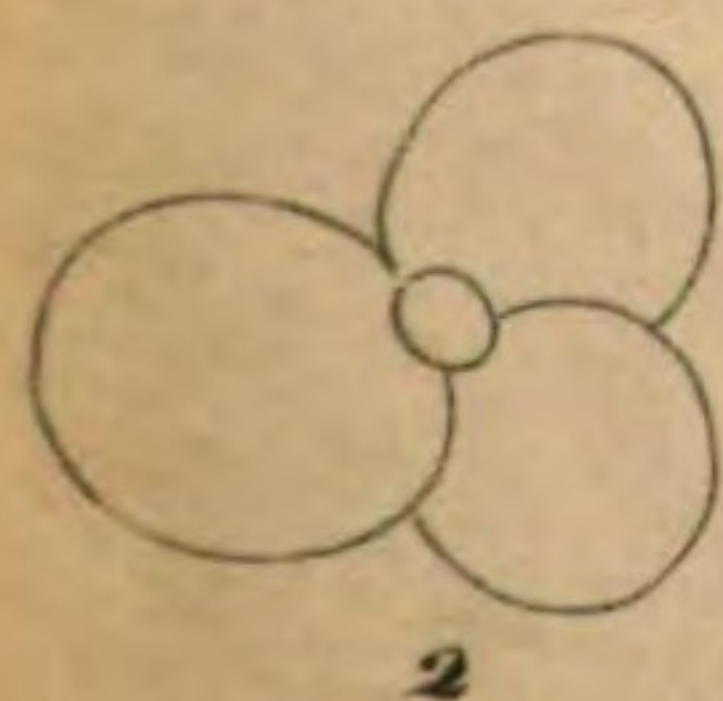
May Apple.

PLATE XXIII.

The *Podophyllum peltatum* or *May apple*, otherwise called *Skunk-cabbage* in this country, inhabits the whole eastern coast from New England to Georgia. At the Atlantic coast I have never met with a specimen more than Boston, yet in the interior of the country it has a more extensive range. From its large creeping roots, it has a great tendency to multiply, and is always found in patches of greater or less extent. Its flowering season is from March to May.

This plant is one of the *Ranunculaceae* of Dillen and *Scillastrum* of Linnæus; and is in the first order of the Class *Polyandria*.

Its generic character consists in a calyx of three leaves; from six to nine petals; and a one-celled berry crowned with the stigma. Only one spe-

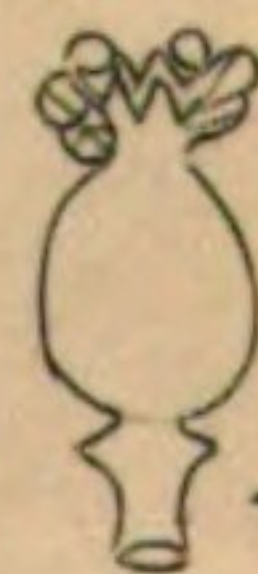


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Podophyllum peltatum



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cies is at present known which strictly belongs to the genus.

The May apple has a jointed running root about half the size of the finger, by which it spreads extensively in rich grounds, where it gets introduced. The stem is about a foot in height, and invested at its base by the sheaths which covered it when in bud. It is smooth, round and erect, dividing at top into two round petioles from three to six inches long. Each petiole supports a large peltate, palmate leaf, smooth above, slightly pubescent beneath, deeply divided into about seven lobes, which are wedge shaped, two parted and toothed at the extremity. On the inside the leaf is cleft almost to the petiole. In barren stems which support but one leaf this does not take place, and the leaf is very perfectly peltate. In the fork of the stem is a solitary flower on a round nodding peduncle one or two inches long. Calyx of three oval, obtuse, concave leaves, cohering in the bud by their scarious margins, and breaking off at base when the flower expands. Petals from six to nine. Linnæus makes them nine in his generic character, but in this climate I have found them more frequently seven even in luxuriant specimens growing in very rich soil. They are obovate, obtuse, concave, smooth, white with slight

transparent veins. Stamens shorter than the petals, curving upwards ; the anthers oblong, twice as long as their filaments. Germ oval, compressed, obscurely angular. Stigma nearly sessile, convex, its surface rendered irregular by numerous convolutions and folds. The flower is succeeded by a large ovate yellowish fruit, which is one celled, many seeded and crowned with the stigma. Its early period of ripening has given rise to the trivial name of *May apple*.

The dried root of the May apple is fragile and easily reduced to powder. It has a peculiar and rather unpleasant taste, but without much acrimony. When chewed for some time, it manifests a strong bitter taste. Both the tincture and decoction are intensely bitter. When water is added to the alcoholic solution the mixture becomes very gradually turbid, and at length opaque. On the other hand, alcohol disturbs both the infusion and decoction, especially the latter, in which it produces, after some time, a pearly whiteness. The trials I have made with it lead me to conclude that it contains a resin, a bitter extractive matter, fæcula and a slight proportion of a gummy substance.

The medicinal properties of the *Podophyllum peltatum* are those of a sure and active cathartic,

in which character it deserves a high rank among our indigenous productions. We have hardly any native plant which answers better the common purposes of jalap, aloes and rhubarb, and which is more safe and mild in its operation. The root is the part to be employed, and should be given in substance in fine powder. I have commonly found twenty grains to operate with efficacy, and not to be attended with pain or inconvenience. In irritable stomachs it sometimes occasions nausea and vomiting, but this effect, as is well known, may ensue from any cathartic medicine. The late Professor Barton informs us, that although the root is an excellent cathartic, the leaves are poisonous, and the whole plant has something of a narcotic quality. Its botanical affinities would justify, *a priori*, a suspicion of this kind. In the various trials which I have made with it, I have not observed any such property in the root. The leaves I have never subjected to experiment for any purpose.

The fruit is acid and agreeable to the taste of many persons. It is sometimes called *wild lemons*, and is eaten with impunity.

The root is said by some physicians to be a medicine particularly suited to dropsy. It has

also had the character in the Southern States of curing intermittent fever.

A physician in Albany informs me that the Shakers at Lebanon, N. Y. prepare an extract of the Podophyllum, which is much esteemed by medical practitioners as a mild cathartic. These people are well known to our druggists by the care and neatness with which they prepare a variety of medicines from native and naturalized pharmaceutical plants.

For medicinal use the root of the May apple is advised to be dug in the cold season, when vegetation is not active, viz. in the autumn and winter. At this part of the year the secretions of perennial plants are concentrated in their roots, and the same weight of their substance is less diluted with the watery or ascending sap, than it is at any other period. This constitutes a reason why the roots of all perennial plants should, as far as practicable, be taken up during the cold season. But from what I have been able to observe, the difference of their virtue in different months is much less than is commonly supposed. I never knew a medicinal plant whose efficacy was destroyed in consequence of being taken up even at midsummer, although it may be in some degree lessened. It is probable that those roots

which constitute staple articles of commerce, as ipecac, gentian, rhubarb, &c. are gathered indiscriminately for exportation at all seasons when they are to be found. Being collected by savages or by ignorant persons, who seek for them in their native wilds, and who are not much interested in their future efficacy; it is probable they would be gathered in greatest quantities when their vegetation was most luxuriant, because at this time their shoots and tops would be most conspicuous. We know this to be the case with our Ginseng, Spigelia, Snake root, &c. which form considerable articles of exportation, and which it would be difficult to find at any other than the vegetating season.*

* *Annual plants* should be gathered at the time when their vegetation is most vigorous, which is generally from the time they begin to flower, until the leaves begin to change. The leaves contain the greatest activity in most annual plants employed for medicine, while the root is a comparatively insignificant part, being small, woody and fibrous. Thus the leaves of Stramonium and Tobacco are much more active than the root.

Biennial plants should, in most instances, be gathered in the second season of their growth, and about the time of flowering. The leaves of these plants also contain their medicinal activity, as in Hemlock and Henbane. The roots are medicinal, but usually in a less degree. In some aromatic biennials, the seeds are the most important part of the plant.

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PLATE XXIII.

Fig. 1. *Podophyllum peltatum*.

Fig. 2. *Calyx*.

Fig. 3. *Stamens*.

Fig. 4. *Germ and stigma*.

Fig. 5. *Fruit*.

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PLATE XXIII.

- Fig. 1. *Podophyllum peltatum*.
 Fig. 2. *Colony*.
 Fig. 3. *Stem*.
 Fig. 4. *Stem and stigma*.
 Fig. 5. *Stem*.



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Scelodes fatidus 3 4

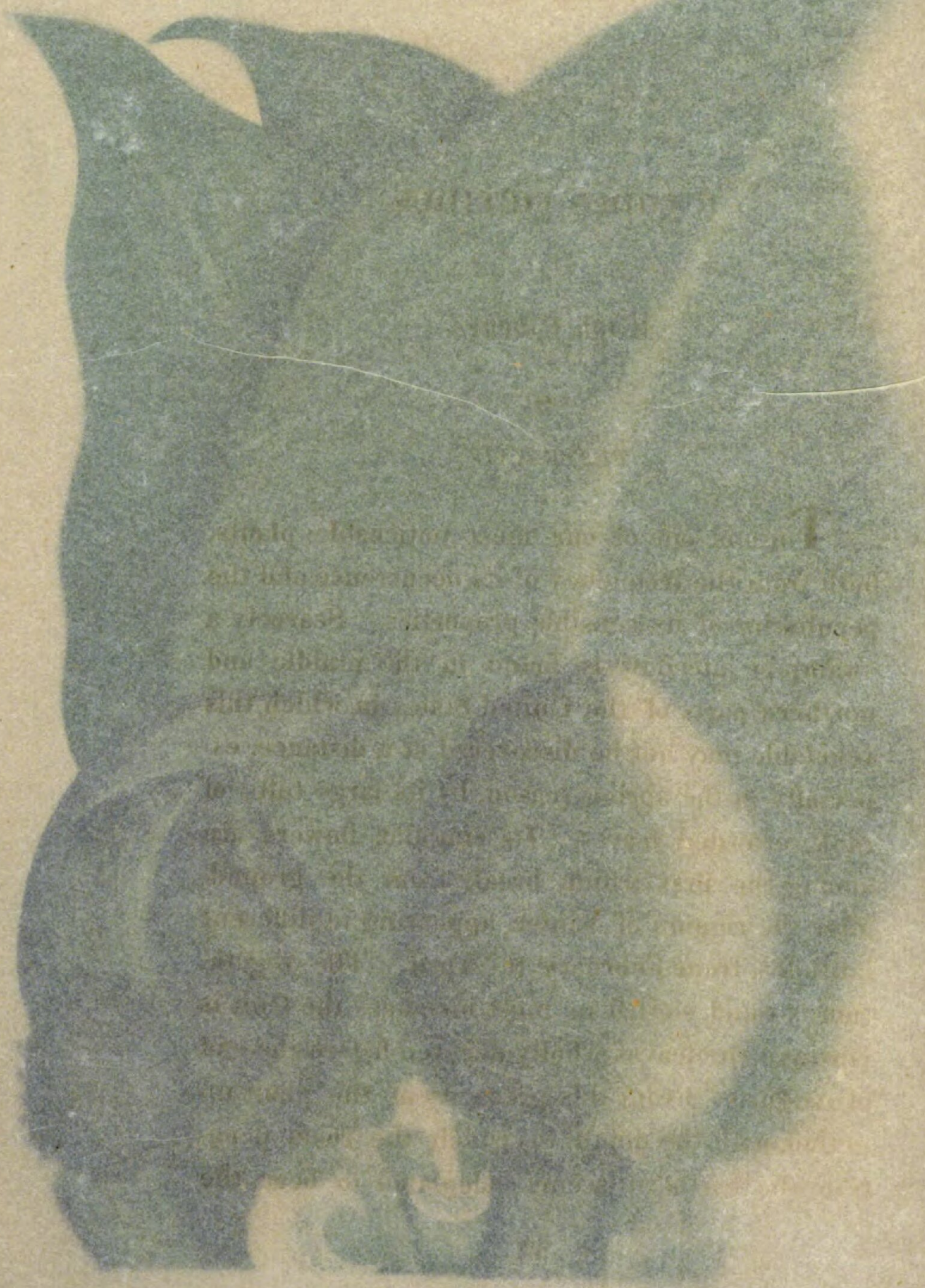
ICTODES FETIDUS.

Stout Cabbage.

PLATE LVII.

THIS is one of our most noticeable plants, both from the frequency of its occurrence and the peculiarity of its sensible properties. Scarcely a swamp or meadow is found in the middle and northern parts of the United States in which this vegetable may not be discovered at a distance, especially in the spring season, by the large tufts of rank, crowded leaves. Its elongated flowers are among the first which break from the ground, after the rigours of winter, appearing in different latitudes, from February to April. The vegetation is rapid, so that in most instances the fruit is ripe and the leaves wholly decayed before the end of August. From this precocity of the plant together with the depth to which the roots penetrate the earth, it seems calculated to bear the

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ICTODES FÆTIDUS.

Skunk Cabbage.

PLATE XXIV.

THIS is one of our most noticeable plants, both from the frequency of its occurrence and the peculiarity of its sensible properties. Scarcely a swamp or meadow is found in the middle and northern parts of the United States in which this vegetable may not be discovered at a distance, especially in the spring season, by its large tufts of rank, crowded leaves. Its singular flowers are among the first which break from the ground, after the rigours of winter, appearing in different latitudes, from February to April. The vegetation is rapid, so that in most instances the fruit is ripe and the leaves wholly decayed before the end of August. From this precocity of the plant together with the depth to which the roots penetrate the earth, it seems calculated to bear the

cold of high latitudes. I have found the flowers a second time formed, and shooting from the ground in November. The strong and unpleasant odour which every part of the plant emits on being broken, and which is precisely similar to that of the *Viverra mephitis*; has given it by an almost common consent, in every part of the country, the appellations of *Skunk weed* and *Skunk cabbage*.

The structure of this singular vegetable has caused it successively to be assigned to the genera *Arum*, *Dracontium* and *Pothos*, with none of which it fully agrees. Of the Aroideæ, to which it is related, it approaches most nearly in its flower to *Pothos*; while its fruit has more affinity to *Orontium*. The Rev. Dr. Cutler many years ago, in the Transactions of the American Academy, pointed out the distinctive characters of this plant, and pronounced it a new genus. No name, however, substantiated by a character, has to my knowledge been given it, in any botanical work, except the name of *Symplocarpus*, a term lately adopted by some American botanists on the alleged authority of Mr. Salisbury. As this name by its etymology implies a resemblance of the fruit to *Symplocos*, a genus with which the plant has not the least affinity; it appears to me inadmissible. Although I am averse to multiply the confusion

of synonyms, with which our science is already too much burdened, yet in the present instance an appropriate name, which should not be at variance with the character of the plant, appeared to be required. With the advice of the venerable Dr. Cutler, I have translated, as nearly as possible, the common English appellation for the plant. The name *Ictodes* from *ἰκτίς*, *xiverra*, and *οἶον*, *oleo*; is sufficiently expressive of the property from which its common name is derived.

The genus *Ictodes* has for its character a *hooded spathe, spadix covered with perfect flowers, calyx with four segments, petals none, style pyramidal, seeds immersed in the spadix*. Only the present plant can be assigned to this genus.

• It belongs to *Tetrandria, monogynia*; and is found among the *Piperitæ* of Linnæus and *Aroideæ* of Jussieu. The root is large and abrupt, with numerous, crowded, fleshy fibres. The spathe which emerges from the ground some time before the leaves, is ovate, swelling, various in width, cucullate, spotted and sometimes nearly covered with dull brownish purple, the top acuminate and incurved, the edges infolded, auriculate at base, and at length coalescing. Within this is the oval spadix, on a short peduncle, covered with perfect tetrandrous flowers, and of the same colour with

the spathe. Calyx leaves four, fleshy, wedge shaped, truncate, the top and edges inflected, the whole crowded together so as to form a compact covering for the spadix. Stamens four, opposite the calyx leaves, with subulate filaments equal in length to the calyx, and oblong four celled anthers. Style four sided, tapering; stigma minute, pubescent; germ roundish, concealed within the spadix. After the spathe decays, the spadix continues to grow, and with it every part of the flowers except the anthers. When the fruit is ripe, the spadix has attained many times its original dimensions, while the calyx, filaments and style are larger, very prominent and separated from each other. Within the spadix at the base of each style is a round, fleshy seed, as large as a pea, white, tinged with green and purple, invested with a separate membranous coat, and with a prominent corculum situated in a depression at top.

The leaves which spring up some time after the flowers are numerous, large and crowded, oblong heart shaped, acute, smooth, with numerous fleshy veins of a paler colour. They spring from the root on long petioles, hollowed in front, and furnished with large oblong sheaths. They continue to increase in size for a month or two after the flowering period is past.

Mr. Nuttall, who has observed the germination of this plant, informs us that the seed does not appear to possess any other cotyledon, than a sheathing stipule, similar to that which is afterwards produced in the plant. The principle bulk of the seed is formed by what he considers a vitellus, having the embryo exactly resembling the future plant, situated in an umbilical depression at its top. The attachment of this body to the embryo is at first by a minute *funiculus*, which enlarges and becomes more distinct during the progress of germination ; but the most singular circumstance respecting it is the length of time for which it continues attached to the growing plant, apparently inert at the base of the candex for twelve or even eighteen months.

The offensive and powerful odour which characterizes this plant is not peculiar to it. The fruit of some of the North American currants, and particularly *Ribes rigens* of Michaux, a species often met with on the high mountains of the Eastern States ; emits when bruised a scent exactly similar to this vegetable.

The odour of the *Ictodes* resides in a principle which is extremely volatile. I have not been able to separate it by distillation from any part of the plant, the decoction and the distilled water be-

ing in my experiments but slightly impregnated with its sensible character. Alcohol, digested on the plant, retains its odour for a time, but this is soon dissipated by exposure to the air.

An acrid principle exists in the root even when perfectly dry, producing an effect like that of the *Arum* and *Ranunculi*. When chewed in the mouth, the root is slow in manifesting its peculiar taste; but after some moments, a pricking sensation is felt, which soon amounts to a disagreeable smarting, and continues for some time. This acrimony is readily dissipated by heat. The decoction retains none of it. The distilled water is impregnated with it, if the process be carefully conducted, but loses it on standing a short time.

A resinous substance is dislodged from the alcoholic solution of the root by the addition of water, the solution becoming moderately turbid. A gummy or mucous principle is also present, and fills the mouth with mucilage when the root is chewed. It is separated from the decoction in small *flocculi* when alcohol is added.

The spadix consists of a fleshy cellular substance, which shrinks very much in drying. The seeds when dry are reduced to half their former size, and in this state they have a tough waxy

consistence and an animal odour. They contain fixed oil in abundance, which is easily forced out from them by expression. Their principal bulk appears to be albumen, and when reduced to powder they are less easily soluble in boiling water, than grains which are less oleaginous. They burn with an oily smoke, leaving behind a large coal.

The sensible properties of the *Ictodes* having a strong affinity with those of *assafœtida* and the other foetid gums, practitioners have been led to expect from it a similar antispasmodic power. Experience has justified these expectations in a variety of disorders of the spasmodic and nervous kind. The Rev. Dr. Cutler of Massachusetts was the first who recommended its use in asthmatic cases. In his account of indigenous American vegetables, he tells us that the roots dried and powdered form an excellent remedy in asthma, and often give relief when other means prove ineffectual. It may be given, he says, with safety to children as well as adults; to the former in doses of four, five or six grains, and to the latter in doses of twenty grains and upward. In a private letter he states, that he made use of it in his own case of asthma for several years, and generally found relief. In the winter he used the dried

root in powder, and in summer, the fresh grated root. It continued to afford more relief than any other remedy, so long as the paroxysms remained under the influence of any medicine. Since the recommendation of Dr. Cutler, many country physicians have employed the root in asthma, catarrh and chronic coughs, with evident benefit. A number of cases have fallen under my own observation of the catarrh affections of old people, in which a syrup prepared from the root in substance has alleviated and removed the complaint. Dr. Thacher informs us on various authorities, that the powdered root has given immediate relief in hysteric paroxysm, that it has affected the cure of dropsy, and that rheumatic patients have found great benefit from its use. Its strong and penetrating acrimony would lead us, *a priori*, to expect advantage from it in these complaints. Even in the more formidable disease of epilepsy, it has appeared to do good.

Some caution, however, is requisite in its management, as serious inconvenience may ensue from an over dose. In delicate stomachs I have found it frequently to occasion vomiting even in a small quantity. In several cases of gastrodynia where it was given with a view to its antispasmodic effect, it was ejected from the stomach

more speedily than common cathartic medicines. I have known it in a dose of thirty grains to bring on not only vomiting, but headach, vertigo and temporary blindness. Other practitioners have given it in larger quantities without any evil of this kind, but I think such an exemption must be attributed to the age and deteriorated quality of the root. Its active ingredients being more or less volatile, it must necessarily be impaired in strength by long keeping, especially in a pulverized state.

To insure a tolerably uniform activity of this medicine, the root should be kept in dried slices and not reduced to powder until it is wanted for use. It may then be taken in pills or mixed with syrup in doses of from ten to twenty grains. These may in most instances be repeated three times a day.

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PLATE XXIV.

- Fig. 1. *Ictodes fœtidus* in flower, the spathe inclosing the spadix.
Fig. 2. The spadix taken out of the spathe.
Fig. 3. The leaves, stalks, &c.
Fig. 4. The spadix in fruit, one quarter being cut away to show the seeds.
Fig. 5. A flower magnified.
Fig. 6. The same opened.
Fig. 7. Petal and Stamen.
Fig. 8. Style.
Fig. 9, 10. Seeds.

PLATE XXIV.

- Fig. 1. A single pistil in flower, the style protruding from the spathe.
 Fig. 2. The spathe taken out of the pistil.
 Fig. 3. The pistil, whole.
 Fig. 4. The spathe in fruit, one quarter being cut away to show the seeds.
 Fig. 5. A flower magnified.
 Fig. 6. The same opened.
 Fig. 7. Petal and stamen.
 Fig. 8. Style.
 Fig. 9. 10. Seeds.





Statice 1

caroliniana

STATES CAROLINIANA.

General Summary.

JOHN SET.

The most extensive and cultivated mari-
time vegetation, the salt marsh, occupies
the greater portion of the coast, which, from their im-
penetrable nature, are not only incapable of sustain-
ing the growth of other species. The mu-
ltitude of roots exposed at the roots of the most vigo-
rous plants, extending to a fresh soil, will often de-
stroy them in a short time. Few forest trees of the
interior can grow in marshes where their
roots are wholly exposed to the access of salt wa-
ter. Yet such is the wise arrangement of nature,
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ry sustenance of the rest. Maritime plants flourish
in places visited by the tide, and those im-



Statice

Caroliniana

STATICE CAROLINIANA.

Marsh Rosemary.

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PLATE XXV.

THE class of vegetables, denominated maritime, or sea shore plants, are constituted to occupy extensive tracts of ground, which, from their impregnation with sea salt, are incapable of sustaining the life and growth of other species. The muriate of soda, if poured at the roots of the most vigorous plants belonging to a fresh soil, will often destroy them in a short time. Few forest trees of the temperate zones can grow in marshes where their roots are wholly exposed to the access of salt water. Yet such is the wise arrangement of nature, that this substance, which proves a poison to most vegetables, is converted into the food and necessary stimulus of the rest. Maritime plants flourish alike in places visited by the tide, and those im-

pregnated by the salt springs of the interior. The degree in which they require the presence of the mineral is various, some growing upon the beach, where the earth is saturated with salt, and others at the extreme edge of marshes, where the impregnation is much less powerful. With a few exceptions, they cannot long be cultivated in fresh earth, but soon decay when removed from their native marshes.

Maritime plants derive a peculiar character from their place of growth, which distinguishes them even when dry from other vegetables. The salt with which they are impregnated crystallizes on their surface in dry weather; and deliquesces so as to render them damp and supple, when the atmosphere is moist. These plants are troublesome in an herbarium from the facility with which they contract moisture from the atmosphere, and communicate it to the adjacent papers. The hay cut upon salt marshes often becomes extremely damp, and would be entirely spoiled, were it not for the antiseptic and preservative quality of the salt. The barilla of commerce is obtained by the combustion of maritime vegetables.

Many of these plants are thick and fleshy in their mode of growth, and differ remarkably in this respect from their co-species on dry ground. This is

particularly seen in *Arenaria*, *Gerardia*, *Chenopodium*, &c.

The vegetable which is the subject of this article is exclusively a maritime plant. It is one of the few ornamental species in our salt marshes, and is very conspicuous for its purple tops appearing among the grass in all the summer months. It varies from a few inches, to a foot and more in height.

This species has generally been considered a variety of the *Statice limonium*, which is a common plant in the salt marshes of Europe. Indeed, several of the maritime species of this genus approach each other so closely in their characters, that they have been considered the same by able botanists. The American plant, to which the name of *Caroliniana* was given by Walter in his *Flora of Carolina*, is distinguished from the European principally by its smaller flowers and plain or flat leaves. From the *Statice Gmelini*, an Asiatic species, it differs apparently still less in its general form.

The genus *Statice* belongs to the class *Pentandria* and order *Pentagynia*. Its natural orders are *Aggregatæ* of Linnæus and *Plumbagines* of Jussieu. It is characterized by a *calyx* monophyllous, plaited and scarious. *Petals* five with

the stamens inserted in their claws. Seed one, invested with the calyx. The species Caroliniana has its scape round and paniced; its leaves obovate-lanceolate, smooth, obtuse, mucronated, and flat on the margin.

The root of this plant is perennial, large, fleshy, fusiform or branched. Several tufts of leaves and scapes are often produced from the same root. The leaves are narrow-obovate, supported by long petioles, smooth, veinless, obtuse, mucronated by the prolongation of the middle rib, level and flat on the margin, in which respect they differ from *S. limonium*, which is undulated. Scape round, smooth, furnished with a few scales, flexuous at top, giving off numerous branches, which end in spikes of flowers; the whole forming a large panicle. The base of each branch and flower is supported by an ovate, mucronated scale. The flowers are alternate, erect, consequently one sided in the horizontal branches; mostly in pairs, but appearing single from one expanding before the other. They grow on a short, forked peduncle, which is concealed by several sheathing scales, part of which are common to the two, and part peculiar to the upper one. The calyx is funnel shaped, five angled, the angles ciliate and ending in long acute teeth with sometimes, not al-

ways, minute intermediate teeth. The upper part of the calyx is scarious and of a pink colour. Petals spatulate, obtuse, longer than the calyx, pale bluish purple. Stamens inserted in the claws of the petals, anthers heart shaped. Germ small, obovate, with five ascending styles shorter than the stamens. Seed oblong, invested with the persistent calyx.

The root, which is the officinal part of the Marsh Rosemary, is one of the most intense and powerful astringents in the vegetable materia medica. It communicates to the mouth an highly austere and astringent taste, combined with a good deal of bitterness. Few vegetable substances, when chemically treated, give more distinct and copious evidence of the presence of both tannin and gallic acid. The sulphate of iron strikes a fine purple colour with the solution, and soon deposits a precipitate, which, on exposure to the air, becomes of an inky blackness. Gelatin also throws down a copious, whitish, insoluble precipitate. Resin hardly exists in this root, nor any thing else exclusively soluble in alcohol. The impregnation with sea salt is readily made obvious.

Dr. Mott, Professor of Surgery in the University of New York, has published an interesting

and valuable investigation of the properties of this plant in 1806. He informs us that the astringency, indicated by the sulphate of iron, was greater in the tincture than in the infusion under experiments precisely similar; from which it may be inferred, that alcohol is a better solvent for this root than water. He also found the cold infusion more powerful than the hot, a circumstance probably to be accounted for by the escape of a part of the gallic acid by evaporation. The astringency was found fully equal to that of galls, and ink made from equal quantities of the two, similarly treated, was equal in blackness.

The *Statice Caroliniana* possesses much medicinal reputation as an astringent, and large quantities of it are annually consumed in different parts of the United States. In Boston it is regularly kept by the druggists, and larger quantities are sold, than of almost any indigenous article. It is principally sought for as a topical remedy in aphthæ and other ulcerative affections of the mouth and fauces. From its astringent and antiseptic quality, it is peculiarly suited to correct the state of these local maladies, and its application is commonly followed with success. It is much better suited to such complaints than the *Coptis trifolia* or gold thread, with which it is

frequently combined, and which is only a tonic bitter without astringency.

Dr. Baylies of Dighton, Mass. employed a decoction of the root, both internally and externally, in the Cynanche maligna, a disease which has at times been epidemic and very destructive in different parts of our country. It proved very successful not only under his own observation, but under that of other physicians in this dangerous complaint.

Dr. Mott informs us, that in the chronic stages of dysentery, after the inflammatory diathesis, great tenesmus, &c. are removed; a strong decoction of the root has restored patients to health, after various tonics and astringents had been used to no effect.

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PLATE XXV.

Fig. 1. *Statice Caroliniana*.Fig. 2. *A flower magnified.*Fig. 3. *Calyx ditto.*Fig. 4. *A petal and stamen ditto.*Fig. 5. *Germ and styles ditto.*

PLATE VII

Fig. 1. Whole plant.

Fig. 2. Flower magnified.

Fig. 3. Fruit.

Fig. 4. A petal and stamen.

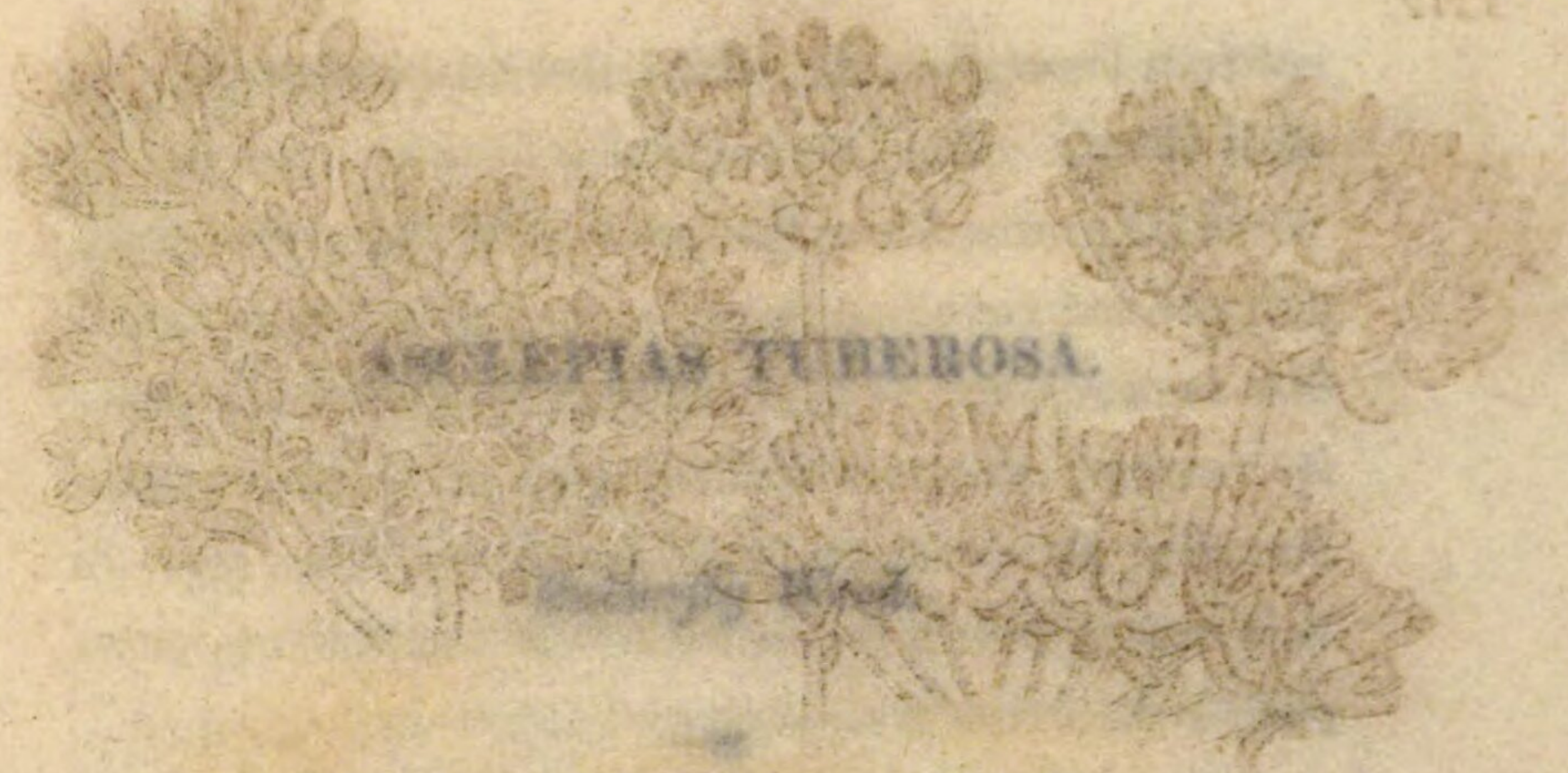
Fig. 5. Germ and style.





Asclepias

tuberosa



ASCLEPIAS TUBEROSA.

PLATE XXXI

Plant species are more various and intricate than those to which our present work is confined. The plants which constitute the genus *Asclepias* are so peculiar in their habit, that they are easily recognized even by the inexperienced observer, while their minute structure is so complicated, as to require not a little attention for its perfect development. This fine race of plants are so abundant in the United States, that every month of the summer season presents a new number of beautiful species. By far the most rich and gaudy of these in appearance is the *Asclepias tuberosa*, known by the vulgar names of *Butterfly weed* and *Pleurisy root*, and found in dry, sandy soils, pine woods, &c. from Massachu-



ASCLEPIAS TUBEROSA.

Butterfly Weed.

PLATE XXVI.

FEW genera are more curious and intricate in their structure, than that to which our present article belongs. The plants which constitute the family of *Asclepias* are so peculiar in their habit, that they are easily recognized even by the inexperienced botanist, while their minute structure is so complicated, as to require not a little attention for its perfect development. This fine race of plants are so abundant in the United States, that every month of the summer season presents us a number of beautiful species. By far the most rich and gaudy of these in appearance is the *Asclepias tuberosa*, known by the vulgar names of *Butterfly weed* and *Pleurisy root*, and found in dry, sandy soils, pine woods, &c. from Massachu-

setts to Georgia. It is the *Asclepias decumbens* of Walter.

This genus has a five parted calyx; a five parted reflexed corolla; a nectary of five erect, cucullate leaves, each producing an inflected horn from its cavity; stamens united, with ten pollen masses hanging by pairs in their cavities. The species *tuberosa* is hairy, its leaves alternate, oblong-lanceolate; its branches cymose.

Class *Pentandria*, order *Digynia*. Natural orders *Contortæ*, L. *Apocineæ*, Juss.

The root of this plant is large, fleshy, branching, and often somewhat fusiform. It is only by comparison with the other species that it can be called tuberous. The stems are numerous, growing in bunches from the root. They are erect, ascending or procumbent, round, hairy, green or red. Leaves scattered, the lower ones pedunculated, the upper ones sessile. They are narrow, oblong, hairy, obtuse at base, waved on the edge, and in the old plants sometimes revolute. The stem usually divides at top into from two to four branches, which give off crowded umbels from their upper side. The involucre consists of numerous, short, subulate leaflets. Flowers numerous, erect, of a beautifully bright orange colour. Calyx much smaller than the corolla, five parted,

the segments subulate, reflexed and concealed by the corolla. Corolla five parted, reflexed, the segments oblong. The nectary or stamineal crown is formed of five erect, cucullate leaves or cups, with an oblique mouth, having a small, incurved, acute horn proceeding from the base of the cavity of each and meeting at the centre of the flower. The mass of stamens is a tough, horny, somewhat pyramidal substance, separable into five anthers. Each of these is bordered by membranous, reflected edges contiguous to those of the next, and terminated by a membranous, reflected summit. Internally they have two cells. The pollen forms ten distinct, yellowish, transparent bodies, of a flat and spatulate form, ending in curved filaments, which unite them by pairs to a minute dark tubercle at top. Each pair is suspended in the cells of two adjoining anthers, so that if a needle be inserted between the membranous edges of two anthers and forced out at top, it carries with it a pair of the pollen masses. Pistils two, completely concealed within the mass of anthers. Germs ovate, with erect styles. The fruit, as in other species, is an erect lanceolate follicle on a sigmoid peduncle. In this it is green, with a reddish tinge and downy. Seeds ovate, flat, margined, connected to the receptacle by long silken hairs. Receptacle longitudinal, loose, chaffy.

The down or silk of the seeds, in this and other species, furnishes an admirable mechanism for their dissemination. When the seeds are liberated by the bursting of the follicle which contains them, the silken fibres immediately expand so as to form a sort of globe of branching and highly attenuated rays, with the seed suspended at its centre. In this state they are elevated by the wind to an indefinite height, and carried forward with a voyage like that of a balloon, until some obstacle intercepts their flight, or rain precipitates them to the ground.

The down of different species of *Asclepias* is susceptible of application to various useful and ornamental purposes. If the fibre were sufficiently long to admit of its being woven or spun, it would approach more closely to silk in its gloss and texture, than any vegetable product we possess. As it is, it has been substituted for fur, in the manufacture of hats, and for feathers in beds and cushions. When attached by its ends to any woven fabric, this down forms a beautiful imitation of the finest and softest fur skins, and is applicable to various purposes of dress. The *Asclepias Syriaca*, from its frequency and the large size of its pods, has been most frequently employed for the foregoing purposes. [Note A.]

The root of the Butterfly weed when dry is brittle and easily reduced to powder. Its taste is moderately bitter, but not otherwise unpleasant. Its most abundant soluble portions are a bitter extractive matter and fæcula. No evidence of astringency is afforded on adding solutions of isinglass or copperas, and hardly any traces of resin on adding water to alcohol digested on the root. The decoction afforded a flaky precipitate to alcohol, when the infusion did not. Boiling water may be considered the proper menstruum for this plant.

This fine vegetable is eminently intitled to the attention of physicians as an expectorant and diaphoretic. It produces effects of this kind with great gentleness, and without the heating tendency which accompanies many vegetable sudorifics. It has been long employed by practitioners in the Southern States in pulmonary complaints, particularly in catarrh, pneumonia and pleurisy, and has acquired much confidence for the relief of these maladies. It appears to be an expectorant peculiarly suited to the advanced stages of pulmonary inflammation, after depletion has been carried to the requisite extent. Dr. Parker of Virginia, as cited by Dr. Thacher, having been in the habit of employing this root for twenty five years, consid-

ers it as possessing a peculiar and almost specific quality of acting upon the organs of respiration, promoting suppressed expectoration, and relieving the breathing of pleuritic patients in the most advanced stage of the disease.

Dr. Chapman, Professor of medicine in Philadelphia, informs us that his experience with this medicine is sufficient to enable him to speak with confidence of its powers. As a diaphoretic he thinks it is distinguished by great certainty and permanency of operation, and has this estimable property, that it produces its effects without increasing much the force of the circulation, raising the temperature of the surface, or creating inquietude and restlessness. On these accounts it is well suited to excite perspiration in the forming states of most of the inflammatory diseases of winter, and is not less useful in the same cases at a more advanced period, after the reduction of action by bleeding, &c. The common notion of its having a peculiar efficacy in pleurisy, he is inclined to think is not without foundation. Certain it is, says he, that it very much relieves the oppression of the chest in recent catarrh, and is unquestionably an expectorant in the protracted pneumonies.

As far as my own observation with this plant extends, I am persuaded of its usefulness in various complaints. It appears to exert a mild tonic effect, as well as a stimulant power on the excretories. Like other vegetable bitters, if given in large quantities, especially in infusion and decoction, it operates on the alimentary canal, though its efficacy in this respect is not sufficient to entitle it to rank among active cathartics. I am satisfied of its utility as an expectorant medicine, and have seen no inconsiderable benefit arise from its use as a palliative in phthisis pulmonalis. Among other instances may be cited that of a young physician in this town, who died two years since of pulmonary consumption. He made great use of the decoction of this root, and persevered in it a long time from choice, finding that it facilitated expectoration and relieved the dyspnoea and pain in the chest, more than any other medicine.

The best mode of administering the *Asclepias* is in decoction or in substance. A teacup full of the strong decoction, or from twenty to thirty grains of the powder, may be given in pulmonary complaints several times in a day. In most cases after the inflammatory diathesis is in some degree subsided, it may be freely repeated as long as it agrees with the stomach and bowels.

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PLATE XXVI.

Fig. 1. *Asclepias tuberosa*.

Fig. 2. A flower.

Fig. 3. A flower dissected, showing the mass of anthers, and one nectary with its horn.

Fig. 4. Magnified section of the mass of anthers, showing the situation of the pistils inside, &c. A pair of pollen masses is drawn out at the top.

Fig. 5. Pistils magnified, and calyx.

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PLATE XXII

- Fig. 1. Asclepias tuberosa.
- Fig. 2. A flower.
- Fig. 3. A flower dissected, showing the mass of anthers and the
 acanthium with its horn.
- Fig. 4. Microscopical section of the mass of anthers, showing the
 action of the papilla inside, &c. A part of pollen mass
 is drawn out at the top.
- Fig. 5. Pistils magnified, and calyx.



Magnolia glauca

MAGNOLIA GLAUCA.

Small Magnolia.

PLATE XXIV

The *Magnolia glauca* is one of the trees known by the name of "Magnolia" on the American continent. It is a species of the genus *Magnolia*. Collectively they furnish perhaps the most complete assemblage produced in the forests of the temperate zone. They are distinguished by their thick, smooth foliage, and fragrant flowers, and opposite bark. Some of them are trees of very marked stature, taking rank with the highest tenants of the woods. The *M. glauca* species is more humble than the rest in its growth, yet more interesting in some of its other properties.

The *Magnolia glauca* has the most extensive range, especially near the sea board, of any of the species of its family. Its most northern bounds



Hesperis matronalis

3

MAGNOLIA GLAUCA.

Small Magnolia.

PLATE XXVII.

OF the splendid family of trees known by the name of Magnolia, the American continent has many species. Taken collectively they furnish perhaps the most elegant assemblage produced in the forests of the temperate zone. They are distinguished by their rich, smooth foliage, large fragrant flowers, and aromatic bark. Some of them are trees of very exalted stature, taking rank with the highest tenants of the woods. The present species is more humble than the rest in its growth, yet more interesting in some of its other properties.

The *Magnolia glauca* has the most extensive range, especially near the sea board, of any of the species of its family. Its most northern bounda-

ry appears to be in a sheltered swamp in Manchester, Cape Ann, about thirty miles north of Boston. It here attains to but small size, and is frequently killed to the ground by severe winters. It is common in the Middle and Southern States, and Michaux informs us, that it is one of the most abundant trees in the morasses of Florida and Lower Louisiana. According to this author however, it is not usually met with far in the interior, or to the west of the mountains. Its common names are various, and change with almost every district. In Massachusetts it has no other name than *Magnolia*; in the Middle States it is called *Swamp sassafras* and *Beaver tree*; while in the Southern States it is denominated *Sweet bay* and *White bay*. It is naturally a tenant of deep boggy swamps, and is somewhat irregular in its growth. It acquires more symmetry of form when cultivated in an upland soil, although its transplantation is difficult. To insure its successful cultivation in a dry soil, the tree should be raised from the seed. This tree begins to flower in different parts of the United States in May, June and July. The flowers are highly fragrant, and may be perceived by their perfume at a considerable distance. A few of them shut up in a room over night communicate to the air a heavy and almost insupportable odour.

The Magnolias are found in the class *Polyandria* and order *Polygynia*; the *Coadunatae* of Linnaeus and *Magnoliae* of Jussieu.

This genus has a *calyx of three leaves*, a *corolla of six petals or more*; *capsules two-valved, imbricated, forming a cone*; *seeds berried, pendulous*.

The present species has *oval leaves, glaucous underneath*; and *obovate petals, narrowed at base*.

The bark of the young twigs is of a bright, smooth green, with rings at the insertion and scars of the leaves. The leaves are scattered, petioled, regularly elliptical, entire, and glabrous. Their under side, except the midrib, is of a beautifully pale, glaucous colour, by which the tree may be distinguished at a distance. When young, this surface is covered with a silken pubescence. Flowers solitary, terminal, on a short, incrassated peduncle. Calyx of three spatulate, obtuse, concave segments. Corolla of from eight to fourteen obovate, obtuse, concave petals, contracted at their base. The stamens are very numerous and inserted in common with the petals on the sides of a conical receptacle. Filaments very short; anthers linear, mucronated, two-celled, opening inwardly. Germs oval, collected into a cone, each one divided by a furrow and tipped with a brownish,

linear, recurved style. The fruit is a cone, consisting of imbricated cells, which open longitudinally for the escape of the seed. The seeds are obovate, scarlet, connected to the cone by a thread, which suspends them some time after they have fallen out.

The bark of the *Magnolia glauca* has a bitter taste, combined with a strong aromatic pungency, which approaches that of *Sassafras* and of the *Acorus calamus*. The aroma resides in a volatile portion, which is probably an essential oil, or a variety of camphor. It is lost from the bark in the dry state, after it has been kept some time. Water distilled from the green bark has its peculiar flavour with an empyreumatic smell. No oil appears on the surface, when the experiment is conducted in the small way. The dried bark affords a little resin, and more of a bitter extractive substance. Chalybeate tests produce a very slight darkening of the green colour of the decoction, but gelatin occasions no change. This might be anticipated from the little taste of astringency in the bark.

As a medicinal article, the *Magnolia* is to be considered an aromatic tonic, approaching in its character to *Cascarilla*, *Canella*, and articles of their class. Considered simply in regard to its tonic

powers, it is probably of a secondary order, though from the additional properties which it possesses of a warm stimulant and diaphoretic is found useful in certain disorders. Chronic rheumatism is one of the diseases in which it exhibits most efficacy. Not only the bark, but the seeds and cones which are strongly imbued with the sensible qualities of the tree, are employed in tincture with very good success in this disease.

In intermittent and remittent fevers the Magnolia is one of the many tonics which have been resorted to for cure by the inhabitants of the marshy countries where they prevail. Sufficient testimony has been given in favour of the bark of this tree, to warrant a belief that it is fully adequate to the removal of fever and ague, when administered like the Cinchona, in liberal quantities between the paroxysms. In the more continuous forms of fever of the typhoid type, it has also received the commendations of physicians.

Several other species of Magnolia resemble the present very closely in their sensible properties, and as far as experiments have been tried, they are similar in their medicinal effects. In order to secure the whole efficacy residing in these trees, a tincture should be made from the bark or cones while green or very recently dried, before their more volatile parts have escaped.

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PLATE XXVII.

Fig. 1. *A flowering branch of Magnolia glauca.*

Fig. 2. *The fruit and seeds.*

Fig. 3. *Stamen magnified.*

Fig. 4. *A germ and style ditto.*

BOTANICAL REFERENCES

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PLATE XXVII

- Fig. 1. A flowering branch of *Magnolia glauca*.
- Fig. 2. The fruit and seeds.
- Fig. 3. Stamen magnified.
- Fig. 4. A pistil and style ditto.



Cornus

florida

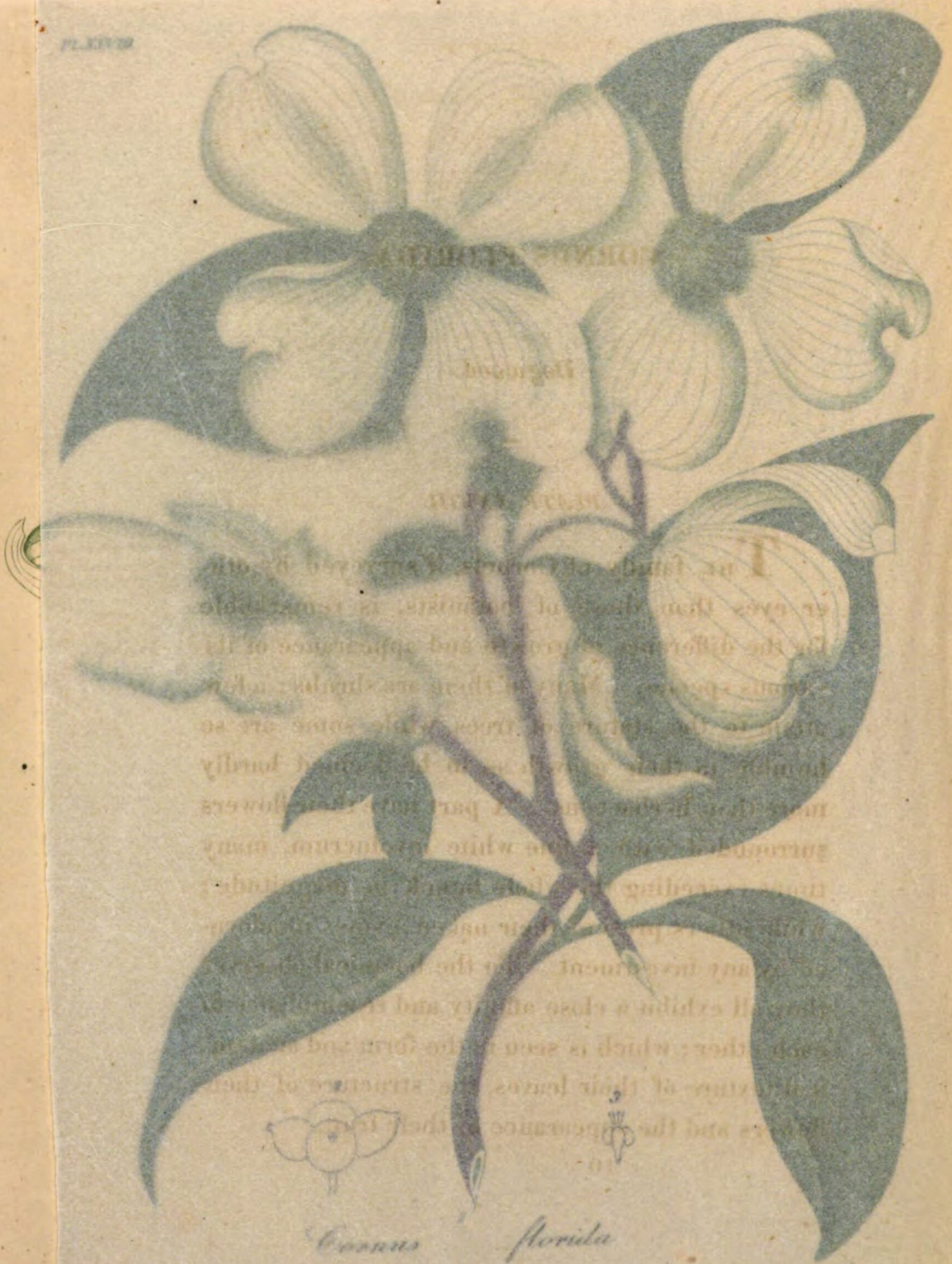
CORNUS FLORIDA.

Dogwood.

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PLATE XXVIII.

THE family of Cornels, if surveyed by other eyes than those of botanists, is remarkable for the difference of growth and appearance of its various species. Many of them are shrubs; a few attain to the stature of trees, while some are so humble in their growth as to be deemed hardly more than herbaceous. A part have their flowers surrounded with a fine white involucrum, many times exceeding the whole bunch in magnitude; while others present their naked cymes unadorned by any investment. To the botanical observer they all exhibit a close affinity and resemblance to each other; which is seen in the form and anatomical texture of their leaves, the structure of their flowers and the appearance of their fruit.



Cornus

florida

CORNUS FLORIDA.

Dogwood.

=

PLATE XXVIII.

THE family of Cornels, if surveyed by other eyes than those of botanists, is remarkable for the difference of growth and appearance of its various species. Many of them are shrubs ; a few attain to the stature of trees, while some are so humble in their growth as to be deemed hardly more than herbaceous. A part have their flowers surrounded with a fine white involucre, many times exceeding the whole bunch in magnitude ; while others present their naked cymes unadorned by any investment. To the botanical observer they all exhibit a close affinity and resemblance to each other ; which is seen in the form and anatomical texture of their leaves, the structure of their flowers and the appearance of their fruit.

The *Cornus florida*, or flowering Dogwood, is the largest and most splendid of its genus, and is one of the chief ornaments of our forests. As a tree it is rather below the middle stature, not usually reaching the height of more than twenty or thirty feet. It is however among the most conspicuous objects in the forests, in the months of April, May and June, according to its latitude, being then covered with a profusion of its large and elegant flowers. In Massachusetts, especially about Boston, it is not a common tree, only scattered individuals appearing here and there in the woods. In the Middle States it is extremely common, especially in moist woods. Michaux informs us, that in the Carolinas, Georgia and the Floridas it is found only on the borders of swamps, and never in the pine barrens, where the soil is too dry and sandy to sustain its vegetation. It is also not very common in the most fertile parts of the Western States, being chiefly found where the soil is of secondary quality.*

* Mr. William Bartram, in his travels in Georgia and Florida, gives the following account of the appearance of this tree near the banks of the Alabama river. "We now entered a very remarkable grove of Dogwood trees, (*Cornus florida*,) which continued nine or ten miles unalterable, except here and there a towering *Magnolia grandiflora*. The land on which they stand is an exact level; the surface a shallow, loose, black mould, on a stratum of stiff, yellowish clay. These trees

The genus *Cornus* is characterized by the following marks. *Petals four, superior; involucrum of four leaves, or wanting; drupe with a two-celled nut.* The species *florida* is arboreous, with its flowers in heads surrounded by an involucrum of obovate leaves with recurved points.

Class *Tetandria*, order *Monogynia*, natural order *Stellatæ*, Lin. *Caprifolia*. Juss.

The *Cornus florida* is of slow growth, and possesses a very compact wood, covered with a rough, broken bark. The branches are smooth, covered with a reddish bark, marked with rings at the place of the former leaves. The leaves, which are small at the flowering time, are opposite, petioled, oval, acute, entire, nearly smooth, paler beneath. They were about twelve feet high, spreading horizontally, their limbs, meeting and interlocking with each other, formed one vast, shady, cool grove, so dense and humid as to exclude the sun-beams, and prevent the intrusion of almost every other vegetable, affording us a most desirable shelter from the fervid sun-beams at noon day. This admirable grove has by way of eminence acquired the name of Dog woods.

During a progress of near seventy miles through this high forest, there constantly presented to view, on one hand or the other, spacious groves of this fine flowering tree, which must in the spring season, when covered with blossoms, present a most pleasing spectacle, when at the same time a variety of other sweet shrubs display their beauty; as the *Halesia*, *Stewartia*, *Æsculus*, *Azalea*, &c. entangled with garlands of *Bignonia*, *Glycine*, *Lonicera*, &c. &c. at the same time the superb *Magnolia grandiflora* standing in front of the dark groves, towering far above the common level." *Travels*, p. 399.

neath, and marked, as in others of the genus, with strong parallel veins. The flowers, which are very small, grow in heads or sessile umbels, upon peduncles an inch or more in length. At the base of each bunch is the large spreading involucre, constituting the chief beauty of the tree when in flower. This involucre is composed of four white, nerved, obovate leaves, having their point turned abruptly down or up, so as to give them an obcordate appearance. This point has frequently a reddish tinge. Calyx superior, somewhat bell-shaped, ending in four obtuse spreading teeth. Petals four, oblong, obtuse, reflexed. Stamens four, erect, the anthers oblong with the filaments inserted in their middle. Style erect, shorter than the stamens, with an obtuse stigma. The fruit is an oval drupe of a glossy scarlet colour, containing a nucleus with two cells and two seeds. The bark of the *Cornus florida* is a powerful bitter, possessing also an astringent and somewhat aromatic taste. Both tannin and the gallic acid are abundantly developed in its solutions by their proper tests. In my experiments with the bark of young twigs, but a small quantity of pure resin was made manifest. It would seem that the principal seat of the bitterness is in a variety of extractive matter.

In a valuable inaugural dissertation on the *Cornus florida* and *Cornus sericea* by Dr. Walker of Virginia, much attention appears to have been bestowed on the chemical properties of their bark. He found that water distilled from the bark in powder had a transparent, whitish appearance, with a slight aromatic odour, and no perceptible taste. When the heat was increased, the fluid had a lemon colour, with an unpleasant smell and an acerb taste. These effects were probably produced by the volatilization and partial decomposition of portions of the bark in consequence of the heat being continued until the mixture was evaporated nearly to dryness.

With a view to ascertain the effect of different menstrua, Dr. Walker subjected to experiment the residual mass furnished by evaporating a decoction of the root of *Cornus florida*. Two drachms of this residuum, which had been furnished by seven and an half ounces of the decoction, were macerated in successive quantities of the best alcohol, until the last portion ceased to be changed in colour and taste. The part, which remained undissolved, weighed only half a drachm. When redissolved it was destitute of taste, and underwent no change of colour on adding the test of iron. The alcohol, which had been employed in the ex-

periment, was found to possess an intensely bitter taste with astringency, of a clear red colour, and turning to a deep black on the addition of iron. On evaporation, it yielded a drachm and an half of residuum.—Dr. Walker attempted to ascertain the quantity of resin by macerating the alcoholic extract in repeated portions of sulphuric ether. The ether acquired a dark colour and a bitter taste, and was found to have dissolved three quarters of the extract. When tested with iron, it was found that the remaining quarter only was changed to a black colour.

The *Cornus florida* is one of the many vegetables which, by the union of their gallic acid with the salts of iron, form a black compound, applicable to the purposes of ink. The constancy of the black colour thus produced varies greatly, according to the substance from which the gallic acid is derived. It is often extremely fugacious, sometimes fading in a few days, and at others becoming indistinct after some weeks or months. Considering the very great importance of the purposes for which ink is employed, and the immense evils which may result from its obliteration in writings intended for permanency; it is with extreme caution that we should recommend the introduction of any change in the mode of its formation. The

oak gall has had the experience of ages in favour of its permanence and immutability. It is not until some indigenous article, producing an equal intensity of colour, has undergone a series of trials from time and exposure, sufficient to establish beyond a doubt its durability, that its substitution in the manufacture of ink should be considered expedient or even justifiable.

Upon the human body the bark of the *Cornus florida* acts as a tonic, an astringent and an antiseptic, approaching in its general effects to the character of the Peruvian bark. From a variety of experiments made by Dr. Walker upon the healthy system, it was found that this medicine uniformly increased the force and frequency of the pulse, and augmented the heat of the body. Collateral experiments were made at the same time with the Peruvian bark, with which the *Cornus* appeared to agree both in its internal and external effects.

In disease it has been principally employed in the same cases for which the cinchona is resorted to, particularly intermittent and remittent fever. Dr. Gregg of Pennsylvania, cited by Dr. Walker, states, that after employing the *Cornus florida* habitually for twenty three years in the treatment of intermittents, he was satisfied that it was not in-

ferior to the Peruvian bark as a means of cure in such cases. Among the number of cures by this medicine, was that of his own case. He observed that in its recent state it sometimes disagreed with the stomach and bowels, but that this tendency in the article was corrected by age. He recommends the bark as being in the best state after it has been dried a year.

Other medical men have employed the bark of this tree with advantage in intermittents, and also in continued fevers of the typhoid type. Its tonic operation in these cases appears very analogous to that of the Peruvian bark.

I have employed the tincture of *Cornus florida* as a stomachic in various instances of loss of appetite and indigestion. The report of those who have taken it has perhaps been as frequently in favour of its effects, as of gentian, columbo, and the other imported tonics of the shops, though perhaps it is somewhat more liable to offend the stomach in large doses. In the Southern States a decoction of the buds and twigs has been thought to agree better with weak stomachs, than the other preparations.

Some other species of this family resemble the present tree in the bitterness and tonic power of their bark, particularly the *Cornus circinata* and *C. sericea*.

The wood of the *Cornus florida* is hard, heavy and fine grained, and susceptible of a good polish. It is employed for various purposes where strength and solidity are required, although its small size does not permit it to be used for objects of much magnitude. From its hardness it is found peculiarly useful for handles of instruments, the teeth of wheels, and the smaller parts of wooden machinery.

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PLATE XXVIII.

Fig. 1. *Cornus florida*, a branch with flowers, and one with leaves.

Fig. 2. Fruit.

Fig. 3. A flower.

PANAX QUINQUEFOLIUM.

Ginseng.

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PLATE XXIX.

IN the early part of the eighteenth century some accounts were sent to Europe by travellers and missionaries, of a root growing in Chinese Tartary, known by the name of *Ginseng*, upon which a high value was set by the eastern Asiatics, and which was sold in the cities of China at an enormous price. Father Jartoux, a missionary at Peking, who had an opportunity of witnessing the collection and use of this root, made a drawing of the plant, accompanied with a particular description, and an account of its uses, and the cause of its high estimation and demand among the Chinese. While on a journey among the mountains of Tartary, performed under the sanction of the emperor of China, he met in various instances



Panax quinquefolium

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Ginseng

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Panax quinquefolium

with the plant and with people employed in collecting it. He states that the root is found principally between the 25th and 27th degree of north latitude, in thick forests, upon the declivities of mountains, on the banks of torrents, and about the roots of trees. It never grows in the open plains or valleys, but always in dark, shady situations, remote from the sun's rays.

As the right of gathering this root is monopolized by the emperor of China, the most extensive precautions are taken by him to prevent an encroachment on this privilege. The places where the fungus is known to grow are rounded with great vigilance, and a whole province, that of Quentsang bordering on the desert, is surrounded by a barrier of wooden stakes, about which guards continually patrol to keep the inhabitants within bounds, and prevent them from making excursions into the woods, in search of the prohibited drug. Notwithstanding this vigilance, their eagerness after gain incites the Chinese to wander by stealth in the desert, sometimes to the number of two or three thousand, in search of the root, at the hazard of losing their liberty, and all the fruits of their labour, if they are taken. The emperor employs his own servants for the purpose of collection, and in the year 1700, had ten

with the plant, and with people employed in collecting it. He states that the root is found principally between the 39th and 47th degree of north latitude, in thick forests, upon the declivities of mountains, on the banks of torrents, and about the roots of trees. It never grows in the open plains or vallies, but always in dark, shady situations, remote from the sun's rays.

As the right of gathering this root is monopolized by the emperor of China, the most extensive precautions are taken by him to prevent an encroachment on this privilege. The places where the Ginseng is known to grow are guarded with great vigilance, and a whole province, that of Quantong, bordering on the desert, is surrounded by a barrier of wooden stakes, about which guards continually patrole, to keep the inhabitants within bounds, and prevent them from making excursions into the woods, in search of the prohibited drug. Notwithstanding this vigilance, their eagerness after gain incites the Chinese to wander by stealth in the desert, sometimes to the number of two or three thousand, in search of the root, at the hazard of losing their liberty, and all the fruits of their labour, if they are taken. The emperor employs his own servants for the purpose of collection, and in the year 1709, had ten

thousand Tartars engaged in scouring the woods in pursuit of the plant. Each man so employed was obligated to present his majesty two ounces of the best he should collect, and to sell him the rest for its weight in pure silver. At this rate it was computed that the emperor would get in a year, about 20,000 Chinese pounds, which would cost him not above one quarter of its value, at the common rate of selling it.

The collectors of the Ginseng carry with them neither tents nor beds, every one being sufficiently loaded with his provision, which is only parched millet, on which he is obliged to subsist during the whole journey. The mandarins send them from time to time some pieces of beef, with such game as they happen to take, which they eat very greedily, and almost raw. They are accustomed to sleep on the ground, and notwithstanding six months are passed in this way, they continue lusty and in perfect health.

The army of herbalists, in order to scour the country effectually, divide themselves into companies of one hundred each, which proceed forward in direct line, every ten of them keeping at a distance from the rest. In this way they overrun an extensive wilderness in a short space of time.

If any one of the company was wanting, as it often happened, either by having wandered out of the way, or being attacked by wild beasts, the party devoted a day or two to search for him, and then returned to their labour.

The root of the Ginseng is the only part preserved. The collectors bury in the ground every ten or fifteen days all that they have procured. In order to prepare it for use, they dip it in scalding water, and scour it with a brush. The roots are then prepared with the fumes of a species of millet, to give them a yellow colour. The millet is put in a vessel with a little water and boiled over a gentle fire. The roots are placed over the vessel upon transverse pieces of wood, being first covered with a linen cloth or another vessel. When treated in this way they assume upon drying a horny or semi-transparent appearance.

The roots may also be dried in the sun, or by the fire, and retain their qualities perfectly. In this case, however, they have not that yellow colour, which the Chinese so much admire.

The Chinese consider the Ginseng as possessing unequalled medicinal powers, and their physicians have written many volumes upon the qualities of the plant. It is made an ingredient in almost all the remedies which they give to their nobility, its

price being too expensive for the common people. The sick take it to recover health, and the healthy to make themselves stronger and more vigorous. They affirm that it removes all fatigue, either of body or mind, dissolves humours, cures pulmonary diseases, strengthens the stomach, increases the vital spirits, and prolongs life to old age. Its price at Pekin, according to travellers, has been eight or nine times its weight in silver, and even more.

Father Jartoux became so far a convert to the virtues of the plant, that he tells us that after having taken half of a root, he found his pulse quicker and fuller, his appetite improved, and his strength increased so as to bear labour better than before. On another occasion, finding himself so fatigued and wearied as to be scarce able to sit on horseback, a mandarin in company perceiving his distress, gave one of the roots. He took half of it, and in an hour was not sensible of any weariness. "I have observed," says he, "that the green leaves, especially the fibrous part of them, when chewed, would produce nearly the same effect. The Tartars often bring us the leaves of Ginseng instead of tea, and I always find myself so well afterwards, that I should readily prefer them before the best tea. Their de-

coction is of a grateful colour, and when one has taken it twice or thrice, its taste and smell become very pleasant.”

The Chinese use a decoction of the root, for which they employ about a fifth part of an ounce at a time. This they boil in a covered vessel with two successive portions of water, in order to extract all its virtue.

The following is the substance of Jartoux's description of the Asiatic plant. The root is whitish, rugged and uneven. The stalk is round, and shaded with red; it terminates in a knot or joint at top, from which proceed four equal branches. Each branch produces five leaves, which are equidistant from each other, and from the ground. The leaves are unusually thin and fine, with their fibres very distinguishable, and a few whitish hairs on the upper side. Their colour is dark green above, and a pale, shining green underneath. All the leaves are serrated or finely indented on the edge.—From the centre of the branches rises a second stalk which is very straight and smooth, and whitish from bottom to top, bearing a bunch of round fruit, of a beautiful red colour, composed of twenty four red berries. The red skin of the berry is thin and smooth, and contains a white pulp. As these berries were double, (for they

are sometimes found single,) each of them had two rough stones, separated from each other, of nearly the size and figure of common lentils. The berries were supported on small sprigs, which rose from a common centre like the rays of a sphere. The fruit is not good to eat. The berries are not round but a little flat on each side. When they are double there is a depression or hollow place in the middle where the two parts unite. Each berry has a small beard at top diametrically opposite to the sprig on which it hangs. When the berry is dry there remains only a shrivelled skin, adhering close to the stones, of a dark red, or black colour.

The plant dies away and springs up again every year. The number of years may be known by the number of stalks it has shot forth, of which there always remains a mark or scar on the upper part of the root.

“As to the flower,” says he, “not having seen it, I can give no description of it. Some say it is white and very small; others have assured me that the plant has none, and that nobody ever saw it. I rather believe that it is so small and so little remarkable, that none of them ever took notice of it.

"There are some plants, which, besides the bunch of berries, have one or two berries like the former, placed an inch or an inch and an half below the bunch. And when this happens, they say if any one takes notice of the point of compass to which these berries direct, he will not fail to find more of the plant."

The foregoing description of Jartoux is introduced as being a very intelligible description of a plant, in language not the most botanical. The drawing, which accompanies the description, is very satisfactory.

The report of the high value of the Ginseng at Pekin led to an inquiry among Europeans, whether the plant was not to be found in parallel latitudes, in the forests of North America. Father Lafiteau, a Jesuit, missionary among the Iroquois, after much search, found a plant in Canada answering the description, and sent it to France. In 1718, M. Sarrasin published in the Memoirs of the Academy an account of the American Ginseng; which, together with one published by Lafiteau the same year, seemed to put its identity with the Chinese vegetable beyond a doubt.

Soon after this the French commenced the collection of the root in Canada for exportation. For this purpose they employed the Indians, who

brought it to the merchants for a certain compensation. At one period the Indians about Quebec and Montreal were so wholly taken up in the search for Ginseng, that their services could not be engaged for any other purpose. The American English engaged in the same traffic, and although the plant is a rare one in the woods, yet very large quantities of the root were collected. In 1748, Kalm tells us the common price of the root at Quebec was from five to six livres a pound.

The first shipments to China proved extremely profitable to those concerned, especially to the French. In a short time, however, the amount exported overstocked the market, the Chinese began to think the American Ginseng inferior to the Tartarian, and its value depreciated, so that it ceased to be an object of profitable commerce. Its demand has not materially risen at any subsequent period, although it is still occasionally exported. The Chinese most readily purchase the forked or branching roots; and those exporters have been most successful, who have prepared their Ginseng by clarifying it after the Chinese manner.

The American Ginseng is thinly scattered throughout the mountainous regions of the Northern and Middle States. Kalm informs us, that it

is seldom found north of Montreal. Michaux states that it inhabits mountains and rich, shady woods from Canada to Tennessee. I have principally met with this plant in the western parts of Massachusetts, and in Vermont, especially on the sides of the Ascutney mountain. Bartram found it near the mouth of the Delaware.

Linnaeus has given to the genus of plants, which includes the Ginseng, the name of *Panax*, a Greek word, intended to express the reputed character of the Chinese *panacea*.

The character of this genus consists in a *simple umbel*; *corolla five petalled*; *berry inferior, two or three seeded*; *plants polygamous*.

The species *quinquefolium* has *three quinate leaves*.

The root of this plant consists of one or more fleshy, oblong and somewhat fusiform portions, of a whitish colour, transversely wrinkled, and terminating in various radicles. Its upper portion is slender and marked with the scars of the former shoots. Stem smooth, round, green, with often a tinge of red, regularly divided at top into three petioles, with a flower-stalk at their centre. Petioles round, smooth, swelling at base. Leaves three, compound, containing five, rarely three or seven leaflets. The partial leaf-stalks are given

off in a digitate manner, and are smooth, compressed and furrowed above. Leaflets oblong, ovate, sharply serrate, acuminate, smooth on both sides, with scattered bristles on the veins above. The flowers, which are small, grow in a simple umbel on a round, slender peduncle, longer than the petioles. The involucre consists of a multitude of short subulate leaflets, interspersed with the flower-stalks. These stalks or rays are so short as to give the appearance of a head, rather than umbel. In the perfect flowers the calyx has five small acute teeth; the corolla five petals, which are oval, reflexed and deciduous. Stamens five, with oblong anthers. Styles two, reflexed, persistent; germ large, inferior, ovate-heart shaped, compressed. The berries are kidney shaped, retuse at both ends, compressed, of a bright scarlet colour, crowned with the calyx and styles, and containing two semi-circular seeds. In most umbels there are flowers with only one style, in which case the berry has a semi-cordate form, as represented in fig. 3. Sometimes there are three styles and three seeds. The outermost flowers ripen first, and their berries often obtain their full size before the central ones are expanded. The middle flowers are frequently abortive.

There are also barren flowers, on separate plants, which botanists describe as having larger petals, and an entire calyx. I have not met with plants of this description in flower.

The foregoing character leaves little doubt that the American plant is precisely the same with the Asiatic, although Loureiro and some others have disputed their identity. The description of Jartoux, which has been given, as well as his drawing of the plant, agrees in every respect, except that his plant had four branches or leaves, instead of three. This is accounted for by supposing he had chosen a luxuriant specimen.—It is somewhat remarkable that the names of the Chinese, and of the North American Indians, should signify the same thing in their respective languages, viz. a resemblance to the *figure of a man*. This resemblance, however, it must be confessed, even in the branching roots, is rather of a humble kind.

The genus *Panax* was placed by Linnæus in his class *Polygamia*, and by late writers in *Pentandria*, *Digynia*. The plants of this family were also referred by Linnæus to his natural order *Hederaceæ*, or somewhat heterogeneous assemblage of vegetables; and by Jussieu to his *Araliæ*. Later botanists have placed them among the *Um-*

belliferous vegetables, from which they differ in their berried fruit. The genus most near to *Panax* is unquestionably *Aralia*, which differs only in the number of styles, a character extremely variable in the Ginsengs.*

The root of the Ginseng has an agreeable taste, consisting of a mixture of sweet and bitter, with some aromatic pungency. Water, both cold and hot, receives a gummy mucus, which is precipitated by alcohol. The watery extract has the taste and smell of the root in a strong degree. The distilled water gives evidence of a volatile oil, and has the aroma, without the sweetness of the root. The common tests indicate the presence of but little resin, and no tannin.

As far as Ginseng has been tried medicinally in this country, and in Europe, its virtues do not appear, by any means, to justify the high estimation of it by the Chinese. That it is not a very active substance, is proved by the fact, that a whole root may be eaten without inconvenience. Its place in the *materia medica* is among demulcents. It approaches more nearly to liquorice, than to any other medicine in its taste and exter-

* *Panax trifolium*, a beautiful little plant, with nearly the herb of *Anemone nemorosa*, has always three styles and a tricoccous berry. *P. quinquefolium* varies from one to three styles, though the usual number is two.

nal qualities. Its extract forms a very neat preparation, and is by no means unpleasant to the taste. Dr. Fothergill tells us, that "in tedious chronic coughs, incident to people in years, a decoction of it has been of service. It consists of a lubricating mucilage combined with some degree of aromatic warmth."

Ginseng is principally sold by our druggists as a masticatory, many people having acquired an habitual fondness for chewing it. It is certainly one of the most innocent articles for this purpose.

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PLATE XXIX.

Fig. 1. *Panax quinquefolium*.

Fig. 2. *A flower magnified.*

Fig. 3. *Umbel in flower, the external fruit nearly grown.*

Fig. 4. *Germ, calyx and styles magnified.*

Fig. 5. *Root.*

PLATE XXIX

- Fig. 1. Flower magnified.
Fig. 2. Flower magnified.
Fig. 3. Flower in flower, the external parts nearly grown.
Fig. 4. Germ, calyx and styles magnified.
Fig. 5. Root.





Polygala Senega

POLYGALA SENECA

Seneca Snake root

PLATE XXX

The Seneca snake root has attracted in general an attention from the medical public, as to have become an article of exportation to Europe, and one which holds a regular place in the druggist stores. The plant which produces it has nothing to boast on the score of elegance, and little to attract attention independent of its medicinal virtues. It grows in most latitudes of the United States, especially in the mountainous parts. The specimen, from which our drawing was taken, was gathered on the borders of Lake Champlain.

The genus *Polygala* has a five leaved calyx, two of the leaves wing like, and coloured. Sepals obcordate, two celled, and two valved.





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The genus *Polygala* has a *five leaved calyx*, *two of the leaves wing like, and coloured*. *Capsule obcordate, two celled, and two valved.*



The species *Senega* has erect, smooth, simple stems, with alternate, lanceolate leaves, broadest at base. Flowers slightly crested.

Class *Diadelphia*, order *Octandria*; natural orders *Lomentaceæ*, Linn. *Pediculares*, Juss.

The *Polygala senega* has a firm, hard, branching perennial root, consisting of a moderately solid wood, and a thick bark. This root sends up a number of annual stems, which are simple, smooth, occasionally tinged with red. The leaves are scattered, nearly or quite sessile, lanceolate, with a subacute point, smooth, paler underneath. Flowers white, in a close terminal spike. The calyx, which in this genus is the most conspicuous part of the flower, consists of five leaflets, the two largest of which, or wings, are roundish-ovate, white, and slightly veined. Corolla small, closed, having two obtuse lateral segments, and a short crested extremity. Capsules obcordate, invested by the persistent calyx, compressed, two celled, two valved. Seeds two oblong-obovate, acute at one end, slightly hairy, curved, blackish, with a longitudinal, bifid, white appendage on the concave side. The spike opens gradually, so that the lower flowers are in fruit while the upper ones are in blossom.

The rose coloured variety of this plant, as it has been considered by Michaux, proves to be a distinct species. Some species which I possess from Carolina have branching, pubescent stems, and very long, loose spikes. The flowers are several times larger than those of *P. senega*.

The root of the *Polygala senega* has an unpleasant and somewhat acid taste. After chewing, it leaves a sensation of acrimony in the mouth, and still more in the fauces, if it has been swallowed. These properties it communicates fully to water upon boiling. The process of decoction does not appear to dissipate any of its power, since the distilled water is destitute of the taste and smell of the plant. Alcohol dissolves a substance, apparently of the resinous kind, giving a precipitate when water is added. Iron produces little change in solutions of this root, and gelatin occasions no alteration whatever.

Medicinally administered, the Seneca snake root is sudorific and expectorant in small doses, and emetic and cathartic in large ones. Its most usual mode of exhibition is in decoction, which may be made of suitable strength by boiling an ounce of the root in a pint and an half of water, till it is reduced to a pint. This preparation may

in most cases be given in doses of a table spoonful and upward without disturbing the stomach.

The first reputation of the Seneca root was one which it divides with a multitude of other plants, that of curing the bite of the Rattlesnake. A reward was given by the legislature of Pennsylvania to Dr. Tennent for the promulgation of this supposed property. When, however, we consider the number of cases of recovery from the bite of this serpent, under every variety of treatment, we cannot avoid the conclusion, that these injuries are not necessarily dangerous, and that spontaneous recoveries are perhaps as frequent as those which are promoted by medicine.

More certain success attends the use of the Seneca in pneumonia and some diseases related to it. In the advanced stages of pneumonic inflammation, after venesection and the other usual remedies have been carried to their proper extent; and the cough still remains dry and painful, while the debility of the patient forbids further depletion; in these cases, I have often found a decoction of the Seneca root to afford very marked relief by promoting expectoration, and relieving the tightness and oppression of the chest. Various medical writers have spoken favourably of its employ-

ment in these cases, among whom are Lemery and others, in the Memoirs of the French Academy. It has been found injurious, from its stimulating properties, when given at too early a stage, or during the prevalence of much acute inflammation.

Benefit has been derived in *asthma* from the use of this plant. The following is Dr. Bree's opinion, quoted from his treatise on that disease. "Decoction of seneka is eminently useful in the first species, administered to old people, but in the paroxysm of young persons, I have found it too irritating. This distinction applies to convulsive asthma purely uncomplicated, but the disease is frequently observed in middle aged and elderly persons, to take the character of peripneumonia notha in the winter and spring, and seneka is then the most useful medicine that I have tried. In such cases, it should be united with acetated ammonia, during the febrile state, and as this state gives way, the addition of squill, and camphorated tincture of opium, will be found to promote expectoration, perspiration, and urine in a most powerful manner."

In croup, this medicine was introduced into notice by Dr. Archer of Maryland. He speaks with much confidence of its utility in that disease,

particularly in promoting the separation and discharge of the membrane formed in the trachea of patients affected by it. Such a membrane, however, does not exist in all cases of croup. And in the early part of the complaint it may be questioned, how far a medicine, which acts as a stimulant to the fauces and neighbouring organs, is entitled to reliance, in a local inflammation of the trachea. It ought not from such a reliance to exclude more active remedies, especially venesection. Dr. Archer's mode of administering it is to give a tea-spoonful of a strong decoction every hour or half hour, according to the urgency of the symptoms, and during the intervals, a few drops occasionally, to keep up a sensible action of the medicine upon the mouth and throat, until it acts as an emetic or cathartic.

In various forms of dropsy, the Seneca root has been resorted to with advantage, and has received the commendations of Percival, Millman, and some others. Its cathartic and diuretic effects are very considerable, when regularly persevered in, in quantities as large as will set easily on the stomach; and have in various instances effected the dissipation of dropsical swellings.

In chronic rheumatism, this root sometimes does good by its universally stimulant and diapho-

retic effects. The following case occurred to me some time since in practice. A man labouring under severe rheumatism was ordered to take at intervals a wine glass full of a strong decoction of the Senega made from an ounce of the root in a pint of water. The patient, from a desire to expedite the cure, thought proper to drink the whole quantity at once. The consequence was the most violent vomiting and purging, which lasted the whole night, accompanied with profuse diaphoresis. The patient, as might have been hoped from the violence of the operation, was radically relieved of his disorder.

In uterine complaints, particularly amenorrhea, the Polygala senega has been found of decided efficacy. Dr. Chapman of Philadelphia is one of the authorities for its use in these cases. It must be given largely, and continued for some time.

The most common mode of exhibition of this root is in decoction, as already mentioned. It is also given in powder in doses of twenty or thirty grains. Dr. Tennent likewise employed a wine of Senega made by digesting four ounces of the root in a pound of wine, of which three spoonfuls were given at a dose.

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PLATE XXX.

Fig. 1. *Polygala senega*.

Fig. 2. *A flower magnified.*

Fig. 3. *Calyx of the same.*

Fig. 4. *Corolla magnified.*

Fig. 5. *Capsule.*

Fig. 6. *A seed.*







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